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The International Journal of Orthodontia

Editor: Martin Dewey, D.D.S., M.D.

VOL. II ST. LOUIS, DECEMBER, 1916 NO. 12

ORIGINAL ARTICLES

THE ROLE OF MOUTH INFECTIONS AND MOUTH ABNORMALITIES IN THE CAUSATION OF DISEASE*

BY EUGENE LYMAN FISK, M.D.

Director of Hygiene, Life Extension Institute, New York City.

THERE is no more important field of preventive medicine than that of the hygiene of the head. The more one studies the modern man—civilized, cultured, pampered, served by scientifically harnessed natural forces almost as was Aladdin by the slaves of the lamp—the more evident it becomes that disease, old age, and death fairly radiate from the cavities of the head.

Take, for example, the repeated acute infections having their origin in obstructed nasal passages lined with unhealthy mucous membranes poorly equipped to meet infection. Season after season the mass of the population suffer from these nasopharyngeal affections involving acute bacterial attack and resultant strain of organic tissue. In some cases death occurs from acute pneumonia, mastoiditis, brain abscess; in others chronic pulmonary disease or tuberculosis. Setting aside the effects of repeated frank, acute nasopharyngeal affections, rhinitis, grippe, tonsillitis, regarded as more or less normal experiences of the average individual, and also eliminating pneumonia and tuberculosis, we have to consider the effects of the establishment in the various cavities of chronic foci of infection. These cavities, tooth-sockets, accessory sinuses, tonsillar crypts, middle ear, etc., are, as Rosenau and others have shown, veritable culture tubes, where the streptococci and pneumococci go into training, as it were, before streaming out to attack those portions of the body where they can best thrive. Thus it is no mere figure of speech to say that in the head are the training camps for the most dangerous enemies of the human race. These microorganisms are among the chief causes of chronic disease and therefore of old age and death. As Mayo has expressed it, "Life is one long struggle with microorganisms."

*Read before the Eastern Association of Graduates of the Angle School of Orthodontia, May 5, 1916.

Deficiency diseases we undoubtedly have, like beriberi, scurvy, and probably pellagra, but I am firmly convinced that long before such stages of serious tissue impairment due to deficiency of vitamins or other necessary elements are reached, there are various degrees of deprivation that lessen the resistance of bacterial attack, substandard conditions of the body that pass unnoticed and unnamed until some organ obviously fails in its task, and then we call it disease.

Eliminating the so-called communicable diseases, such as typhoid and tuberculosis, we still have a tremendous death-rate from disease that is essentially due to infection. Chronic cardiorenal-vascular diseases are responsible for more than twenty-five per cent of the total death-rate. We know now that in all these organic affections, bacteria play a prominent and often the principal part. Injury, strains, poisons, endogenous or exogenous, all have their influence, but bacterial attack must be recognized at some stage of the game. I believe I am safe in saying that if the cavities in the head could be kept in a thoroughly healthy state, free from infection and their functions well maintained, at least four years could be added to the expectation of human life. This sounds like a little bit, but it means a tremendous reduction in the death-rate.

I would not minimize the role of the intestine as a great focus of subinfection, and of miscalled auto-intoxication. But it is not as guilty as formerly supposed. Indeed, in much of the damage that it does, it is merely an accomplice after the fact of focal head infection that has travelled downward.

The freedom with which bacteria range throughout the human organism has only lately been recognized. Subinfection, radiating from focal infection, must be recognized as one of the principal factors in organic impairment. Even in tuberculosis we find that the process of infection is not so simple as formerly supposed. The fact that tubercle bacilli can traverse the stomach and intestinal canal, penetrate the walls of the intestine without leaving any trace, and finally reach the bronchial glands or lungs, is an illustration of the losing fight that mankind is maintaining with the various forms of bacteria.

Since death comes to all ultimately, always in the form of a pathological state, I am justified in terming this a losing fight. What I have said regarding the hygiene of the head and the importance of the head cavities as potential factors in organic disease, emphasizes the tremendous responsibility upon those who are specializing in that region. It is the region par excellence for the entry of infection, as well as for nutritive material and oxygen.

It would be difficult to find an individual with absolutely normal and perfectly functionating head cavities. In using this expression, I am of course excluding the brain. Harry Campbell has recently stated that there are upwards of two hundred millions of carious teeth in the British Isles, and even a greater number of infected tooth sockets, while as to jaws, it is rare to meet a normal one. There is no reason to believe that these conditions are any better in this country. False teeth, long teeth, irregular teeth, infected gums, asymmetric jaws, are the rule rather than the exception. The field, therefore, is an almost limitless one, and the chief responsibility upon the specialist, as upon all others who are working in modern medicine, is to begin as early as possible in the life of the individual to detect abnormalities of these cavities, correct them, and protect the individual from future impairment.

The protection of the deciduous teeth falls to the parent and the dentist, as a part of mouth hygiene. While success in this direction will limit the need for the orthodontist, there will always be plenty for him to do in correcting those forms of irregularity and asymmetry due to heredity or other causes. Also, on the one hand, the orthodontist can lessen the need for rhinological work and septal operations, while, on the other hand, the rhinologist can in his own field assist the individual to a healthy and more vigorous development of the upper jaw and lessen the need for orthodontia in that region, also the general practitioner or hygienist can, by regulating the diet and training the child to eat properly, prevent dental irregularities.

It is desirable to carry to the profession at large the knowledge of the possibilities of orthodontia, knowledge that it performs far more than a cosmetic service, that while the relief of deformities has a very high value from a social and even health standpoint, these tooth irregularities contribute very largely to mouth infection and hence to organic disease. It seems true that the modern mouth is degenerate in its parts.

There may be members present who have studied this question more deeply than I have, in which case I should be more than glad to have additional evidence on this point. There is, however, abundant evidence to show that in a state of nature man's jaws are more vigorous and symmetrically developed, and that he is also comparatively free from other head abnormalities and asymmetries so common among the civilized. Whether early mental development and educational strain have anything to do with this matter, as some authorities have suggested, I am unable to say; but heredity, and deficiencies in the diet in infancy, as well as the long list of hygienic errors that characterize civilized life, must be given due weight.

These possibilities of head infection emphasize what is true of all the other regions of the body: namely, that from infancy on, they should be regularly inspected for abnormal conditions. I differ with Dr. Cabot, who claims that these inspections are of limited value unless made by specialists in each region. That is not feasible as applied to the mass of the public, but under a proper routine, as advocated by the Life Extension Institute, a well-trained general practitioner can make such periodic examinations to detect the need for further special attention.

We must sharply distinguish between the clinic for established disease and its treatment, and this sifting process by which the early signs of disease are noted and the patient shunted to whatever special clinic or clinician his needs may require.

It is amazing what an automatic, systematic sieve of this description will reveal. Indeed, it will bring out more evidences of impairment than is usually the case when a man drifts aimlessly around from one specialist's office to another. The examiner who is trained and educated to make such a survey performs the function of a sort of medical air-man, who searches out the enemy's weaknesses and gives information by which successful attack can be made.

The following figures from the examinations of the Institute will give you an idea of the operation of this principle:

RESULTS OF PHYSICAL EXAMINATIONS OF INDUSTRIAL AND COMMERCIAL WORKERS BY THE LIFE EXTENSION INSTITUTE COMPARED.

	Industrial. Average age 31.6 years.	Commercial. Average age 27.8 years.
Free from physical defects or unhealthful living habits	0.46%	0.81%
Slight impairments or errors in living habits	27.16%	22.96%
Moderate impairments, needing medical, dental, or hygienic treatment	67.15%	71.81%
Important impairments, requiring close medical supervision and treatment	5.20%	4.28%

It will interest you to know that 69 per cent of these people examined showed need of dental attention, and that among the number showing that need, organic impairment was found to the extent of 22 per cent in excess of those without dental impairment.

I think you will agree with me that this specialized assistance, such as workers in the field of orthodontia are able to render, should not be left to the haphazard initiative of patients. The detection of these abnormalities that require your aid should be a systematic, routine affair, applied to the whole population. It is then up to you to provide facilities by which the benefits of this treatment shall not be limited to the idle rich, but extended by some means to all who need it.

INTRAMAXILLARY ANCHORAGE

By Martin Dewey, D.D.S., M.D., Kansas City, Mo.

Professor of Dental Anatomy and Orthodontia, Kansas City Dental College; President of The Dewey School of Orthodontia.

INTRAMAXILLARY anchorage may be defined as that type of anchorage in which the resistance necessary to overcome a malposed tooth is obtained from a tooth located in the same arch.

Intramaxillary anchorage is divided according to two plans. The first plan is based upon the number of teeth employed in the resistance, and the second upon the manner in which the resistance is obtained. We speak of intramaxillary anchorage as being simple or compound, according to the number of teeth employed, the latter being sometimes called "reinforced." In the seventh edition of Angle's book on "Malocclusion of the Teeth," and in my work, "Practical Orthodontia," the word "simple" was used to designate anchorage according to method and is defined as being "that form of anchorage where the resistance is obtained from a large tooth more favorably located." Owing to the great amount of confusion that has arisen in the use of the term "simple," it was decided to change the term so as to refer to numbers instead of plans. Therefore, in reading this article it will be well to remember that the terms have been changed in that respect, and that "simple anchorage" is here used as referring to the number of teeth from which resistance is obtained and not to the size and location of the

anchor teeth. This may cause more or less confusion in the minds of some, but when using the term "simple" in regard to method and "compound" in regard to numbers, the confusion continually exists in the minds of students, because in the general use of these two words they are opposite in meaning.

The term "simple anchorage" is used in this paper as referring to numbers and that form of anchorage obtaining resistance from a single tooth. In Fig. 1, taken from the seventh edition of Angle's book, we have a very good illustration of a case of simple intramaxillary anchorage in which a second deciduous molar is used to overcome the resistance necessary to move the incisor. No provision has been made in the construction of the appliance to enlist

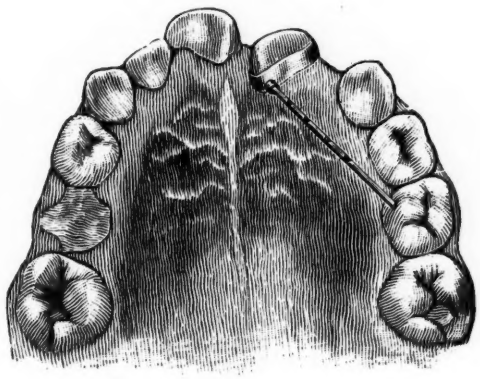

Fig. 1.

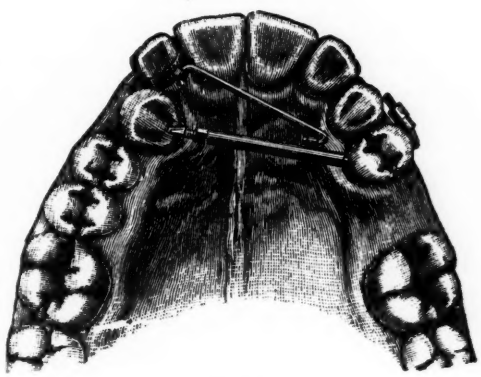

Fig. 2.

the support of any of the other teeth, however, it must be remembered that, although the appliance is attached only to one tooth, owing to the intimate connection of the fibers of the peridental membrane, there will necessarily be some force transmitted or taken up by the surrounding tissue and proximating teeth.

Compound or reinforced intramaxillary anchorage is that form of anchorage where two or more teeth are used to overcome the resistance of the malposed tooth. The construction of this appliance provides for the embracing of two or more teeth. An example of intramaxillary anchorage is shown in Fig. 2 which includes the use of the jackscrew, with attachments made to the incisor which supports the premolar carrying the anchor band; and by the proximal contact,

all of the incisors, to a certain extent, become anchor teeth. This compound or reinforced anchorage may be produced by banding more than one tooth, or it may be produced by constructing or applying an auxiliary appliance attached to a spur soldered to the band so as to embrace or rest against more teeth than would be influenced by the band itself. Fig. 3 shows a type of reinforced or compound primary intramaxillary anchorage in which a spur has been soldered to the lingual surface of the anchor band on the second premolar, the spur resting against the first premolar and molar with the result that the force exerted on

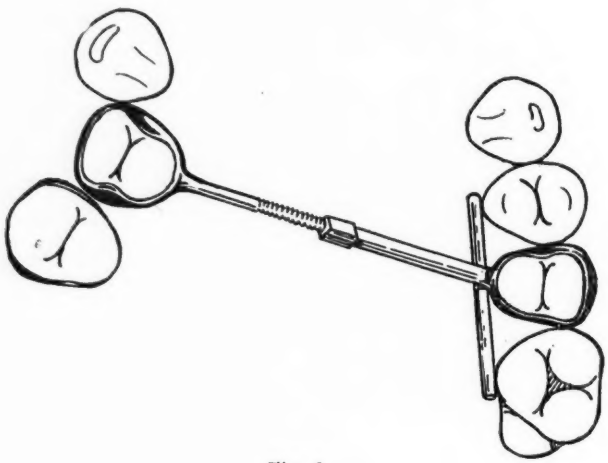

Fig. 3.

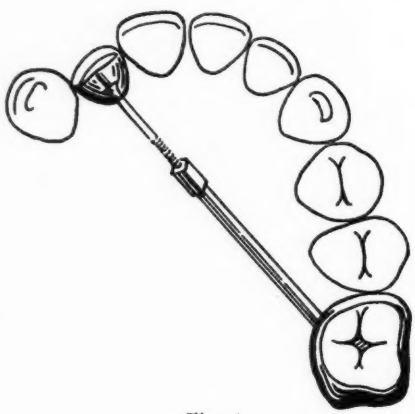

Fig. 4.

the premolar as an anchor tooth is also exerted upon the proximating molar and premolar. This presents a type of reinforced or compound intramaxillary anchorage in which the same appliance is used as shown in Fig. 4, which represents a case of simple intramaxillary anchorage. In considering simple and compound intramaxillary anchorage, it must be remembered that it makes no difference which teeth are employed, how the appliance is attached, or what kind of an appliance is used; the classification being based solely upon the number of teeth mechanically attached to the appliance. This classification, simple and compound, must not be confused with the method of attachment which brings us to another classification of anchorage. A great many more examples of simple

and compound intramaxillary anchorage might be shown, but the above are sufficient for the purpose of illustrating these two types of anchorage.

METHOD OF ANCHORAGE.

In taking up the consideration of methods of anchorage, we have to deal with the plans of obtaining the resistance to overcome the malposed teeth. We have three plans in intramaxillary anchorage which are known as primary, stationary, and reciprocal. In the classification of anchorage as given in my "Practical Orthodontia," the term used is "primary anchorage" when referring to numbers because the term "simple anchorage" has already been appropriated by other writers with reference to method. As mentioned in the first part of this paper, owing to the confusion that has arisen in the minds of students, it has been decided that it would be better for orthodontia to use the word "primary" in reference to method and let it describe the same type of anchorage as Angle has described under "simple" anchorage.

Simple primary intramaxillary anchorage is then defined as that type of anchorage in which the resistance necessary to overcome the malposed tooth is derived from a larger tooth or one more favorably located. An example of simple primary intramaxillary anchorage is shown in Fig. 4.

Compound primary intramaxillary anchorage is that form in which the force necessary to produce movement of the malposed tooth or teeth is overcome by two or more teeth larger or more favorably located. In compound primary intramaxillary anchorage, if it is necessary to move a tooth which requires a large amount of force, we obtain that force by utilizing two or more teeth and thus get the resistance from an increased number and a more favorable location. In compound primary intramaxillary anchorage, it makes no difference whether or not more than one tooth carries a band, only so far as we enlist more than one tooth as the anchor tooth. Primary anchorage has also been described as that type in which, if sufficient force is brought to bear upon the anchor tooth, it will tip through the process instead of moving bodily. The primary intramaxillary anchorage defined by Angle under the term "simple anchorage" is that "form in which, first, resistance is overcome by the anchor tooth or teeth of larger size or of a more favorable location, and second, the form of attachment to both anchor tooth, and teeth to be moved, is hinged or pivoted, admitting of tipping of both in their sockets." In this definition he includes both simple and compound intramaxillary anchorage and discusses the point that makes intramaxillary anchorage of the primary type different from stationary anchorage. Primary intramaxillary anchorage is the easiest type of anchorage obtained because, regardless of how the appliance is attached to the anchor tooth when we depend only upon the resistance of the anchor tooth, we necessarily must have primary intramaxillary anchorage. However, with this type of anchorage it must be remembered that no extra resistance is obtained by the construction or the attachment of the appliance; if sufficient force is brought to bear upon the anchor tooth it will necessarily be tipped.

With primary anchorage, the knowledge of the alveolar process and the

anatomical surroundings must be employed in order to obtain as favorable a location of the anchor tooth as possible. The relative sizes of different teeth must also be considered as well as the different degrees of ease with which the teeth move in different directions. It must be remembered that a molar can be moved mesially with greater ease than it can be moved distally. Upper molars as a rule, can be moved buccally more easily than they can be moved lingually. The reverse is true of the lower molars, especially the second and third molars. The upper incisors as a rule, will move labially more easily than they will move lingually. When speaking of the different resistance offered by different teeth when moving in different directions, it must be remembered that we are considering conditions in a normal alveolar process and with normal attachment to the teeth. One of the problems of anchorage which we encounter is the fact that in certain individuals the alveolar process is not normal as the result of which teeth move with much less force than they will in other mouths. An example of faulty alveolar process is found in those patients that have rickets or possess a rickety diathesis. In those cases, it is almost impossible to tell with any degree of certainty which teeth will move as a result of the application of force. For instance, if the alveolar process around the malposed tooth, or the one which is to be moved, is more normal than that around the anchor tooth, the anchor tooth will be displaced before the malposed tooth will move. Therefore, a set rule laid down for the movement of anchor teeth or malposed teeth as a result of anatomical resistances, can be applied only in individuals who have normal alveolar process. Owing to the fact that primary anchorage depends only upon the position of the anchor tooth and is not dependent upon the construction of the appliance so as to increase the anchorage, and owing to the fact that in a large number of cases the resistance of the tooth is not sufficient to produce tooth movement, it is necessary to evolve another type of intramaxillary anchorage which is described as "stationary anchorage."

Stationary anchorage as described by Angle is "that form in which the attachment to the anchor tooth is essentially rigid, so that tipping is impossible, and if it is moved at all, it must be dragged bodily through the alveolar process in the upright." This form of anchorage, according to Angle's writing, was first introduced in the second edition of his work, and he also refers to it in *Items of Interest,* December, 1887. He gives credit to Barrett "who first made use of this form of anchorage, though in an imperfect manner, by means of a vulcanite plate entirely covering the vault of the arch and molars, but this, of course, did not admit a strict rigidity of attachment." Stationary anchorage, however, was evolved by the early writers because of the difficulties encountered in producing certain tooth movement when depending entirely upon the "size and location of the anchor tooth." Owing to the fact that stationary anchorage differs from primary anchorage in the form of attachment, a better definition than the one given, is—stationary anchorage is that form in which the appliance is so constructed and attached to the anchor tooth that if the anchor tooth moves at all, it will be dragged bodily through the process. There are two features involved in the stationary anchorage which are not employed in primary anchorage; namely, the appliance must be constructed rigidly and must be rigidly attached to

the anchor tooth. This appliance described in Angle's work shows the use of the screw similar to the one shown in Fig. 5. Now, in order to have stationary anchorage with the traction screw, the traction screw must be so rigidly attached, and so rigidly constructed, that there will be no bending in that portion of the attachment on the canine and on the molar. It must also be so accurately adjusted that there will be no play between the tube that is soldered to the molar

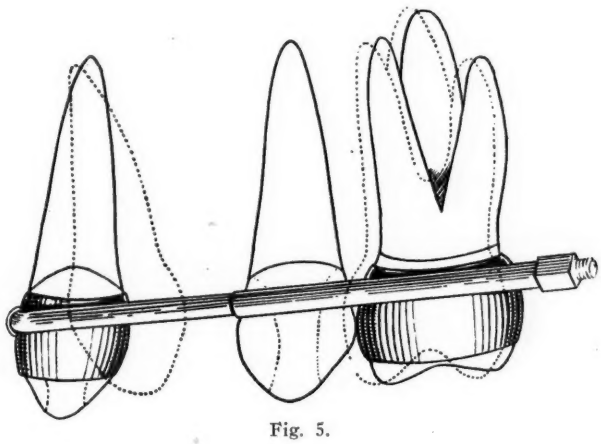

Fig. 5.

band and the portion of the screw that extends to the canines. In order to insure the rigidity in the use of the stationary anchorage, there should be as much of a point of bearing between the fixed portion of the appliance and the moving portion of the appliance as is possible. In other words, all tubes which are rigidly attached to the bands on the anchor teeth should be as long as possible to receive the portion of the appliance that is going to be the active part.

In the next installment of this paper we will take up the various methods of obtaining stationary anchorage with the alignment wire.

A "PATENT" SUGGESTION

By Harry P. Beaser, Fresno, Calif.

SINCE the time of the invention of the porcelain crown, the subject of patents has occupied the attention of the dental profession to a great extent.

From the beginning of time men have progressed by invention, which is nothing more nor less than the discovery of a new idea, and laws have been made with the object of protecting the inventor so that he can reap the benefits therefrom.

There are, however, a great number of men whose only desire is to create something new and useful, and the big majority of men in the dental profession belong, I think, to this class. But owing to the fact that there are those who are unscrupulous enough to take advantage of this generosity, these men have been compelled to protect their inventions by law when they had no wish to get any financial gain therefrom.

I would therefore suggest that the National Dental Association take the matter of patents into their hands and either create a board commission to look after this subject, or make it a part of the Research Commission. If this were done, men in all branches of the profession, and the public at large, could send their inventions to this department of the National Dental Association knowing that no individual would get the benefit of the idea for his personal gain to the exclusion of all others.

This patent board could look into the merits of the invention, and if found worthy of consideration, could obtain a patent in the name of the National Dental Association, giving the originator due credit on their records and in the *Journal of the National Dental Association.*

The dental profession, especially in America, has reached its high standard of efficiency through the inventive genius of its members; and there have been many new ideas of great value which have never gone beyond the door of the office because the founders did not wish to undergo the expense of obtaining a patent, or take the chance of losing them by giving them to the profession, and then have some one else get the patent on their article and make them pay royalty for the creation of their own minds; also for the reason that they did not wish to place themselves in the position of trying to collect a royalty from other members of the profession.

If this suggested system had been a fact a number of years ago, there is no doubt that a great deal of trouble would have been avoided; e. g., previous to the time of the discovery of the method of making the cast gold inlay, the disappearing wax models had been used for other purposes. If this had been recorded and taken care of by the National Dental Association at the time of its real discovery, no process patents would ever have been given and no trials for infringements would ever have entered the courts.

This may all be an old idea and I do not claim originality for it, but from investigations I have been able to make I have not discovered it. I believe, however, that it could be worked out to advantage even if it cost the profession a few cents per head more than their present dues, for all would reap the benefits alike and many disagreeable and costly law proceedings would be eliminated. It would certainly be a cure for a lot of unprofessionalism and trend toward bringing all men closer together for the common good.

TREATMENT OF CERTAIN TYPES OF MALOCCLUSION WITH THE AID OF BRIDGE-WORK

By H. E. Bliler, D.D.S., Chicago, Ill.

THE correction of malocclusion must necessarily be considered from different angles and there are certain factors entering into the treatment of one case which may not influence another—the time required to correct the malocclusion, the inflammation created, the inconvenience to patients, their financial status, and the best mode of procedure to obtain quick and lasting results. Every general practitioner should be able to correct simple cases, especially where it is not possible to refer the patient to a specialist, as in the smaller towns and rural districts. It is a well known fact that cases can be treated successfully at a certain age while at a more advanced period of life the treatment of them is much more

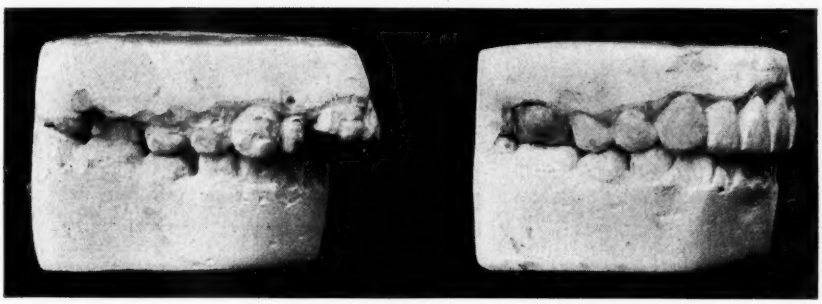

Fig. 1.—Showing models of case before and after treatment. Fifteen days was allowed for shrinkage or absorption of the V-shaped arch.

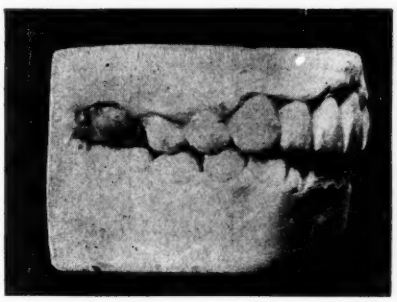

Fig. 2.—Gold crown was placed on six-year molar.

troublesome even if not prohibitive. It must also be remembered that certain people can give a considerable length of time to the treatment of malocclusion while others have a limited amount of time and cannot devote several years to the treatment, if there is any other means of accomplishing an improvement in a shorter space of time. It must also be remembered that in some instances the financial inability of the patient to pay for a long treatment, even though the result meant the ideal condition, often causes the operator to decide in favor of a plan whereby he accomplishes results in much less time even though the results are not as ideal as those that require a greater amount of time.

Fig. 1 shows the model of a case of a girl fifteen years of age who was not able to spend the necessary time and money to have the case rectified by orthodontic methods. Also the amount of deformity which is shown in the teeth would have necessitated some bridge-work in the end. Fig. 1 was made from an impression taken by having the patient bite on wax. It shows that the lateral incisors

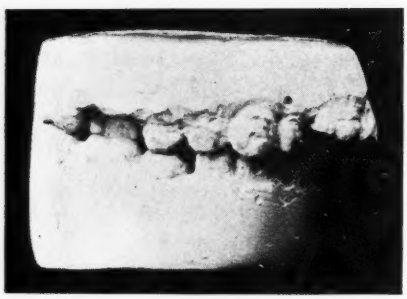

Fig. 3*A*.—Gold crown was placed on six-year molar.

Fig. 3*B*.—Patient was a mouth-breather, not able to keep her lips closed on account of prominent centrals.

Fig. 4.

Fig. 5.

Figs. 4 and 5.—Gratifying results obtained by mechanical skill, when nature helps.

were small, consequently something was required in order to improve the lateral incisors as well as to correct the protrusion of the centrals. Both centrals, which were oversized, were extracted and the pulp was killed in the two undersized lateral teeth. February 29th I cut off the lateral teeth and made a four-tooth bridge, using porcelain interchangeable teeth, with the half-band attachment,

finishing March 3rd, giving the appearance as shown in Fig. 2. One of the central incisors was broken off, the lateral incisors were undersized, and it necessarily made a very unpleasing type of malocclusion, which is shown in Fig. 3. Fig. 4 shows the appearance of the patient's face and lips in repose after the case was treated, while Fig. 5 shows the appearance of the patient's face while smiling. In my opinion it was the correct solution of the case regardless of her ability to pay more or less.

We are aware of the fact that the extraction of an anterior tooth in the correction of malocclusion is to be avoided, but here was a case where the centrals were deformed by being oversized, one of them was broken off, the lateral incisors were small, even if the strictly orthodox plan of orthodontic treatment was followed bridge-work and restoration would have been necessary. This meant time and money as a decided factor, consequently, the method of extracting the two large incisors, and adjusting a four-tooth bridge by using the small lateral incisors as abutment, was decided upon. In fact I am very much in doubt if a better appearance could have been accomplished considering the patient we had to work on, and the condition in the beginning, if a different plan had been followed However, in the use and the construction of the bridges for the correction of malocclusion, they must be constructed according to anatomical laws, the force of the occlusion must be observed, the operator must be positive that the constructed bridge will be better in appearance than the deformed and mutilated teeth which are extracted.

I get good results many times by extracting the lower central in badly crowded conditions rather than torturing the patient by trying to widen the arch, or by extracting the first bicuspid and trying to move several teeth over. By extracting the central, the teeth will straighten themselves out, and it is good practice for poor patients, who otherwise would have crowded teeth all their lives. I extracted a lower lateral tooth for a man, 37 years old, and the teeth straightened, without any appliances, in a year's time.

BANDS OR CROWNS FOR TEMPORARY MOLARS

By W. A. Coston, D.D.S., Topeka, Kansas.

THE difficulties—discomfort and sometimes pain attending the proper fitting and adjusting of anchor bands on molars, especially the temporary molars, is sometimes quite annoying to both the little patient and the dentist, and the fact that they sometimes do not stay on—that they loosen, come off, or are driven into the soft tissue by the force of occlusion, and cause inflammation of the gingivæ, if not the peridental membrane, or sometimes cause etching of the enamel, is also quite annoying. All of these things happen to the "busy dentist," and the following method, which has proved very satisfactory to the author, is suggested for the relief and the comfort of the little patient.

The indirect method of making various restorations has been a great benefaction to dentists—especially the general practitioner, and a great factor in all

prosthesis—as we have learned that crowns, inlays, clasps, and almost every appliance or restoration that is to be cemented to place, can be made with more accuracy, generally speaking, and certainly with more facility than we have been able to do by any other method. This idea applied to the making and fitting of anchor bands is quite as practical as for the making of bands or crowns for

Fig. 1.—Thin copper band trimmed to festoon of gum.

Fig. 2.—Impression of tooth in compound.

Fig. 3.—Impression with celluloid strip wrapped around it.

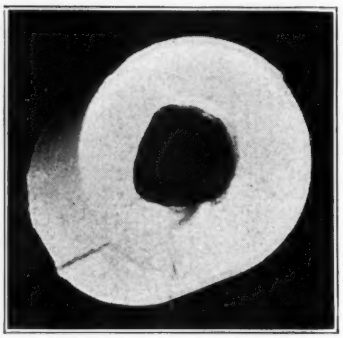

Fig. 4.—Impression invested in plaster.

Fig. 5.—Copper amalgam model of tooth.

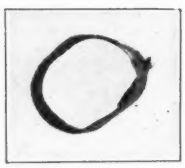

Fig. 6.—Band soldered with lap joint.

Fig. 7.—Band swedged.

Fig. 8.—Cusp swedged for band.

Fig. 9.—Band with cusp soldered and cut out for occlusion.

Fig. 10.—Crown with tube and lug.

any other purpose. After the necessary separation for the application of a band, an impression of the individual tooth is taken, using a thin loosely fitting copper band, trimmed to the festoon of the gum (Fig. 1), and made thin enough to pass into the approximal space without crowding, which is filled with soft modelling compound, and forced to place on the tooth. When chilled it is removed

(Fig. 2), encompassed with a celluloid strip (Fig. 3), and sunk into thin plaster (Fig. 4.) When the plaster is set the impression is filled with copper amalgam, mixed to a soft consistency as in indirect work. When the amalgam has set, the plaster containing the model is slightly warmed (for safety), broken open, and the amalgam model cleaned, using chloroform to remove any traces of modelling compound.

We now have a practical duplicate of the crown of the tooth in amalgam (Fig. 5) upon which a band of any description may be fitted with facility. In the method suggested, band material of a suitable gauge is cut from a tin foil pattern, and soldered, with lap joint (Fig. 6), and fitted to the model (joint on opposite side from the tube or other attachment), trimmed cusp-high or sometimes overlapping the cusps and marginal ridges a little. If necessary the band is slit a little and lightly burnished over and into the developmental grooves and margins to prevent displacement, and is then swedged to place in cylindrical swedge with vulcanite rubber. The band is then removed and the cusps trimmed high, allowing the band to lap over the occlusal surface at any place where it will not conflict with occlusion as in the buccal and lingual developmental groove (Fig. 7). This can now be reinforced with solder and used as a plain band, if desired, or, a thin piece of metal can be cut and annealed and swedged right over the band and model which will be forced down into the fissures and sulci and over the edge of the band (Fig. 8) ; then remove and solder to the band and finish. The crown, for such it is, will slip into place on the tooth, many times with a spring, and will interfere very slightly with occlusion, which interference can be remedied by grinding or cutting away the interfering metal from the occlusal surface, leaving enough overlapping the occlusal surface to prevent the band being forced gingivally into the tissue, should it loosen (Fig. 9).

The tubes or attachments can be soldered (Fig. 10), the band electroplated, and cemented to place with thin well-mixed cement, which causes it to stay on, that is, reasonably well, without any chance of gingival inflammation, if the cement is all cleaned off as it should be. The band can be any gauge desired for strength, but 34-gauge is surely thick enough. The cusp can be much thinner and in cementing the pressure should be on the band—or attachment thereto, and even a little lug can be soldered to the lingual for the purpose, as shown on Figs. 9 and 10, but pressure should not be on the soft and thin cusp.

If in the opinion of the operator the band swedged directly in the model fits too closely, first swedge and burnish tin foil, No. 60, over the model and then proceed as before mentioned—the result is accurate but loosely fitting.

A REMOVABLE RETAINING APPLIANCE

By Harry P. Beaser, D.D.S., Fresno, Calif.

RETAINING appliances are mechanical devices placed upon the teeth which have been moved from positions of malocclusion to hold them in a straight line of occluion until the natural forces have been established which will maintain them in their proper position. Retaining appliances are divided into the fixed and removable, each one of which posesses advantages and disadvantages. The fixed appliance can probably be made a little more delicate than the removable appliance, but it holds the teeth more rigidly, as a rule, and does not admit of being removed so that the teeth can receive prophylactic care during retention. In the mouths of some patients who have always kept their teeth clean and whose teeth are not susceptible to cavities, a fixed appliance may be used without any ill results. However, in those mouths where prophylactic care must be given the teeth, an appliance which is removable, so that the parts can be kept clean, is better, and will be found a great advantage.

The appliance which is shown in the cuts is a retaining appliance constructed so that it will fill nearly all of the requirements of practically any case of malocclusion. It can be made equally adaptable to a mesioclusion, neutroclusion, or a distoclusion case. The accompanying cuts show it constructed for a distoclusion case. One of the principal advantages it has over other mechanical retainers is that it is constructed as separate parts so that any one may be removed at any time without interfering with the rest. If a band becomes loosened on any tooth, it can be recemented without removing the entire appliance or running the risk of changing the shape. Each band is made and attached separately the same as an appliance constructed for treatment, thus reducing the difficulties to a minimum and at the same time producing the maximum of efficiency. It is also a well known fact that single bands are more easily set and more accurately fitted to the teeth than are three or four bands which are attached to one appliance, which necessitates the cementing of all at the same time. The appliance may be made either active or passive at any time or modified or added to at the will of the operator with the very least amount of time and trouble. Taken altogether this will come near to occupying that position so much required by orthodontists, that is, a retaining appliance which can be made into an active regulating appliance, whenever the emergency arises, and all orthodontists know this emergency arises very often. The maintenance of tooth position has caused orthodontists more trouble than all other intricacies in science. This fact is shown by early investigators who wrote at length describing all manners of appliances for the movement of the teeth with very little or nothing about retention. It is plain to admit that there was very little understood about the physiological changes which took place during the treatment of malocclusion.

It is very thoroughly understood at the present time that a correct diagnosis is absolutely necessary, not only to outline the course of treatment, but the retention as well, yet at the present time there is less difficulty experienced in

treatment, than in maintaining the teeth in the line of occlusion after they are placed there. This fact I believe is due to the construction of too rigid appliances for retention.

Nature if given a crutch will invariably lean upon it, but if forced to stand, will build a foundation for herself. This fact is proved in hundreds of

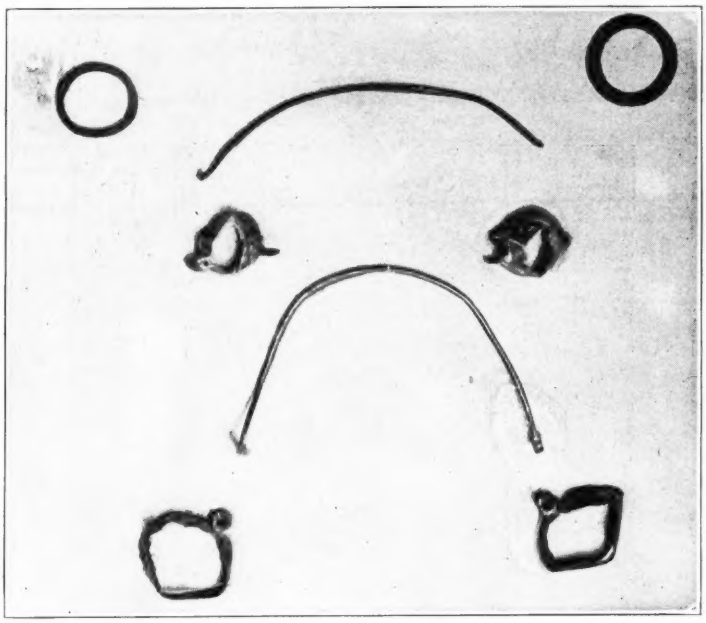

Fig. 1.

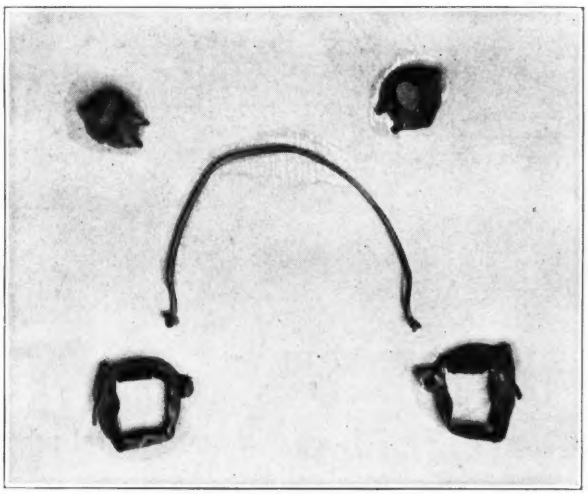

Fig. 2.

ways, for instance, the horse-riding Indians of the plains almost lost the art of walking. The body of a man who sits continuously, conforms itself to the shape of the chair, and the muscles all but lose their normal functions. A strong healthy person may start the use of drugs to stimulate some part of the system and in a short time the system requires the drug in order to perform its duty.

Thus it is with the teeth, and if a too rigid retainer is used, the teeth will lean upon it, and the tissues will atrophy instead of building strength. Therefore that appliance which will permit a free movement of a tooth in any direction, only acting as a guide to its position in the dental arch and permitting all of the forces of occlusion to act in harmony, is the one which will produce the best results.

The cuts here show the appliance fitted to a case of bilateral distoclusion which has been produced by mouth breathing. The materials used are the same as for any other appliance. Plain bands are made for the molars and canines,

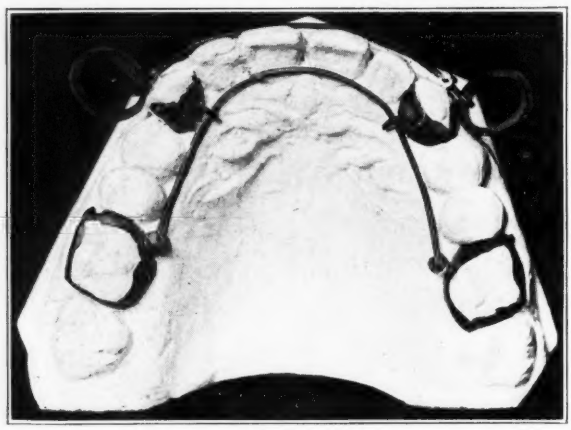

Fig. 3.

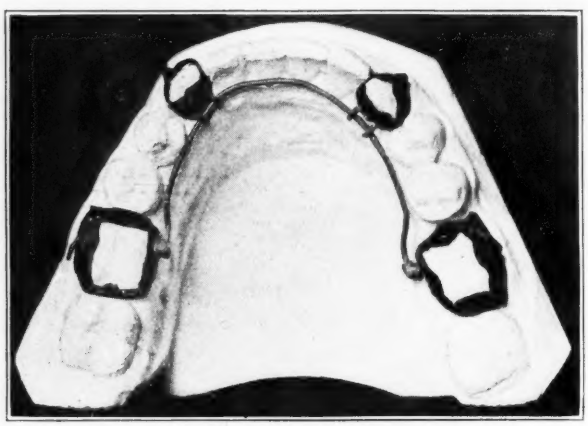

Fig. 4.

upper (Fig. 1), and lower (Fig. 2). A 16 gauge vertical tube is soldered to the lingual side of the molar bands and a slot cut on the mesial surface about two-thirds of the length of the tubes from the occlusal end, large enough to permit a 20 gauge wire to slip in easily. When the wire is adjusted to the lingual surface of the teeth the ends are cut even with the inner side of the slot. The wire is then taken out and a piece of 16 gauge wire soldered perpendicular to each end making a T shape on each end of the 20 gauge wire. It is then slipped into the tubes and cut off smoothly. The T-shaped end on the 20 gauge wire which fits in the vertical tube prevents the molar from rotating.

In soldering the tubes to the molar bands they should be set at a slight angle so as to prevent the lingual wire from slipping out.

Small hooks are soldered to the linguo-cervical part of the canine bands (as in many other appliances) to engage the lingual wire and prevent it from slipping up. (Figs. 3 and 4.)

To antagonize the outward tendency of the upper anterior teeth a piece of

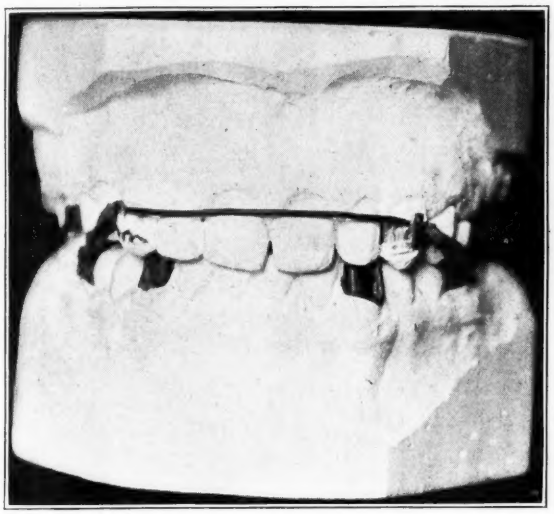

Fig. 5.

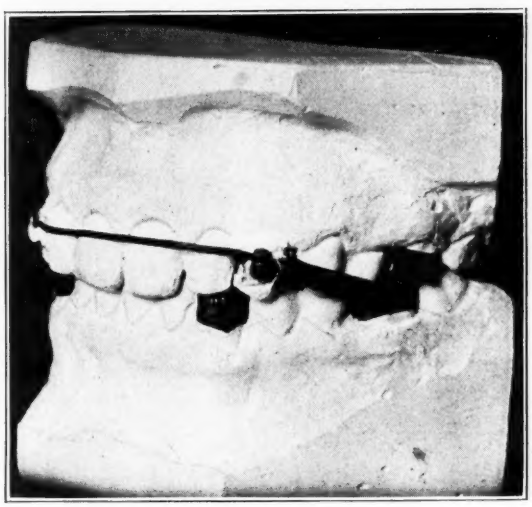

Fig. 6.

18 gauge tubing is soldered to the labial surface of the upper canine bands and a slot cut downward mesially and distally from the cervical end about two-thirds of the length, large enough to permit the easy access of a piece of 20 gauge wire. This can best be accomplished by filing the tubes about half through for the desired length and then soldering to the bands. A piece of 20 gauge wire will then be cut long enough to make a hook on each end and after being adjusted to the surfaces of the incisors will be slipped into place. (Fig. 5.) To prevent the rotation of the canine a perpendicular spur can be soldered to the labial wire to engage the tube on the canine band.

Intermaxillary rubbers will then be adjusted from the end of this labial wire to hooks on the lower molar band . (Fig. 8.) The ends of the tubes may be pinched together to prevent the wire from slipping out or being taken out by the patient, thus possessing all the qualities of the rigid soldered appliance without having any of its bad features.

If more freedom of movement is desired in the teeth to which the appliance is attached, the slots may be widened laterally at the points where the wires enter the vertical tube and the short 16 gauge pieces may be tapered at the ends giving the effect of a ball and socket joint.

Some writers have spoken disparagingly of the removable retaining appliances which various orthodontists have constructed from time to time, claiming that they were invented because of the inability of the operator to do free hand soldering with sufficient accuracy. This, however, I do not think worthy of much consideration, for a thing is not necessarily good because it is hard to make, or another bad because it is more simple; simplicity, efficiency, and durability being the most desired qualities that any appliance can possess.

Different sizes and kinds of material may be used as the operator sees fit to apply to the case in hand and modifications may be made to suit any class of work.

A REPORT OF AN ACCIDENT

By H. B. Hamilton, D.D.S., Ithaca, N. Y.

DENTAL accidents, more or less serious, are a frequent occurrence among children, and the following case is of interest because of the age of the child and the probable consequences on the growth of the mandible.

Betty H., aged eighteen months, knocked out three lower incisors in a fall down a flight of steps. The right central came out clean. The left central and lateral and a portion of the outer plate of process remained attached to the gum only, which, joining distal to lateral, was torn to the apex of the root. These two teeth lay in a horizontal position, the gum acting as a hinge and flopping back and forth with every movement of the tongue and lip.

At first, the case seemed hopeless, but it was found that the two teeth, when placed back in position, required but little to hold them. The canines were, of course, unerupted, and the age of the patient made it difficult to fit bands; so complete reliance for support was placed on the right lateral which was uninjured. A band was fitted to the lateral with a spur soldered to it sufficiently long to extend beyond the left lateral and cemented to place with the spur pressing lightly against the loosened teeth. Not quite enough pressure was obtained at first to hold the teeth back far enough, but this was corrected a few days later. Healing took place rapidly, and with the exception of recementing the piece a couple of times and removing three or four particles of process, no other treatment was required. A liquid diet was used for about four weeks. No attempt was made to replace the right central, and when last seen, about six weeks after the accident, the two teeth were in about the center of the space formerly occupied by the three teeth, and the canines just showing through the gum.

DEPARTMENT OF
DENTAL AND ORAL RADIOGRAPHY

JAMES DAVID MCCOY, D.D.S., EDITOR,
LOS ANGELES, CALIF.

ELECTIVE LOCALIZATION OF THE STREPTOCOCCUS FROM A CASE OF PULPITIS, DENTAL NEURITIS AND MYOSITIS*

BY EDWARD C. ROSENOW, M.D., ROCHESTER, MINN.
The Mayo Foundation, Rochester, Minnesota.

LOCALIZED infections in or about the roots of teeth have already been considered in causal relationship to systemic disease and to neuralgia of the face. Experimental proof of the nature of this relationship, however, is still undetermined. In this paper I wish to record the history of a case in point and the results of experiments which appear to throw light on the subject.

Case 567.—Mrs. F. H. P., aged thirty-five years, had been subject to severe migraine for many years. For the past five or six years she has suffered from recurring attacks of neuralgia of the face, which began with severe pain and distinct swelling over the left upper jaw, spreading to the opposite side, with soreness in the teeth, especially in the upper jaw, and followed by intense pain in the left side of the head, neck and shoulders. During the last two or three years the attacks have occurred oftener and had grown so severe as to necessitate the frequent use of hypodermics of morphine; the attacks have ended with spasm of the muscles, and tenderness and swelling of the neck on the left side. Her tonsils were removed four years ago, but this did not relieve the condition. One year ago the second left upper molar showing a blind abscess at the root was extracted, the left maxillary sinus drained and a piece of the left turbinate removed, but without relief. She became extremely nervous, at times hysterical during the paroxysmal pain, and has had one or two spells of mental confusion suggesting *petit mal.* Previous to tonsillectomy, she had had for years one or more attacks of tonsillitis followed by rheumatic pains during the winter months.

Examination revealed a poor vasomotor tone, moderately firm muscles, fair nutrition, and the general appearance of a nervous woman. On January 13, the hemoglobin was 85 per cent; the leukocytes 9800. A Wassermann test of the blood proved negative. On February 17, the hemoglobin was 80 per cent; the erythrocytes 4,210,000; the leucocytes 5400. There were no signs of organic disease of the central nervous system. The examination of the

*Read before the American Association of Immunologists, Washington, D. C., May 11, 1916. Reprinted by special permission from *The Journal of Immunology*, Vol. I, No. 4, August, 1916. Received for publication June 4, 1916.

heart, lungs, abdomen, reflexes, urine, Rœntgen examination of the jaws, roots of teeth, and blood pressure, were all negative. There was tenderness over the left infraorbital foramen and mental foramen, but no superficial tenderness of the overlying skin. There were tender nodules, which appeared to be enlarged glands in the posterior triangle of the left side of the neck. There was a clean tonsillectomy scar, a normal condition of the nose except moderate hypertrophic rhinitis, and a normal condition of the gums and teeth, except a tender dead first upper left molar which had been crowned, but from which the crown had been removed on account of the irritation of the gums. The maxillary sinuses were clear. Owing to the fact that each attack began with swelling of the left upper jaw opposite the dead tooth and in the region of the left infraorbital foramen, the tooth was extracted January 18. There was found a semi-lunar eroded area 2 mm. in diameter near the apex of the largest and inner fang. The surface of this was sterilized with a searing blade, and the root-canal drilled into from the apex with a dental burr. The pulp-cavity was filled with a foul-smelling pus. The erosion was situated so that it was impossible to be shown by the Rœntgen ray. The pulp-cavity of the other two fangs was filled and obliterated and there were no erosions at the apices. There was a large cement filling directly opposite the dead pulp. Smears from the pus from the root showed a few Gram positive diplococci, diphtheroid bacilli and a few Gram negative bacilli. The primary cultures in ascites-dextrose agar and broth gave a pure culture of a slightly hemolyzing streptococcus. The anerobic cultures on blood agar slants and in tall columns of ascites fluid containing sterile tissue, covered with paraffin oil, had a foul odor and many short chains of streptococci and numerous bacilli resembling *Bacillus fusiformis.*

Immediately after the extraction of the tooth, the patient developed an unusually severe attack but she gradually recovered after several exacerbations. On February 17, after having been free from pain for ten days and gaining rapidly in weight and strength, there was found a definite tenderness of the muscles in the posterior triangle on the left side of the neck and two distinct tender nodules just behind the posterior margin of the sternomastoid muscle. One of these tender nodules, thought to be a lymph-gland, and a portion of the deeper layers of the muscle, was excised. One-half of these tissues were immediately emulsified for cultures and the other half fixed in formalin-Zenker for sections. The excision of the fascia and muscle precipitated another violent attack of pain and spasm of the muscles of the left side of the neck. The cultures in tall columns of ascites plain broth of the emulsion of muscles showed a pure culture of a short chained streptococcus and those from the thickened fascia, streptococci and staphylococci.

Blood agar plates from the culture in ascites plain broth from the tooth pulp and from the muscle (injected into animals) showed pure cultures of streptococci producing a narrow hazy zone of hemolysis. It was thought that this streptococcus might be present quite generally on the mucous membrane in this patient. Cultures from the nose and pharynx and three out of six cultures from the stool proved that this was actually the case.

Sections of the excised muscle showed marked increase in the interstitial

tissue, poorly staining nuclei of adjacent muscle fibers, and slight round cell infiltration (Fig. 1). Sections of the fibrous nodule and fascia showed old and young connective tissue, absence of lymphoid tissue, small nests of round cells, plasma cells, and erythrocytes, chiefly around blood vessels. Gram-Weigert and methylene blue stains for bacteria revealed a moderate number of diplococci in or adjacent to the fibrous tissue between the muscle fibers and nests of cel-

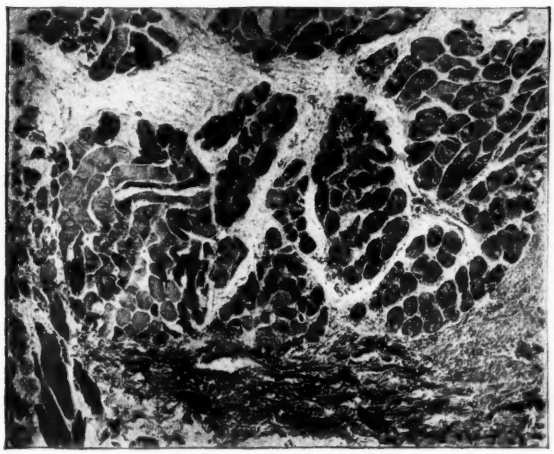

Fig. 1.—Section of the muscle excised from the left side of the patient's neck. Note the marked infiltration by connective tissue, the irregular staining and the atrophy of muscle fibers. Hematoxylin and eosin. X 60.

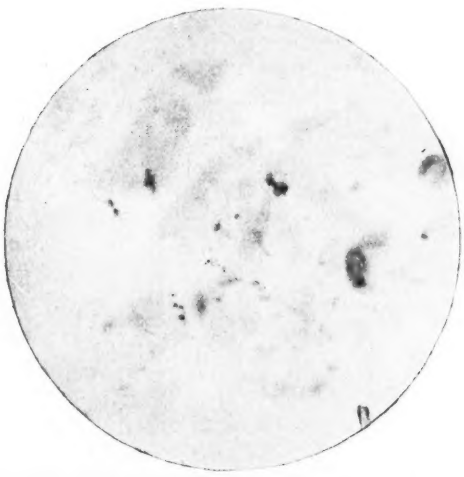

Fig. 2.—Diplococci, singly and in short chains, and two leucocytes in tender fibrous node in the deep fascia from the left side of the neck. Methylene blue and eosin. X 1000.

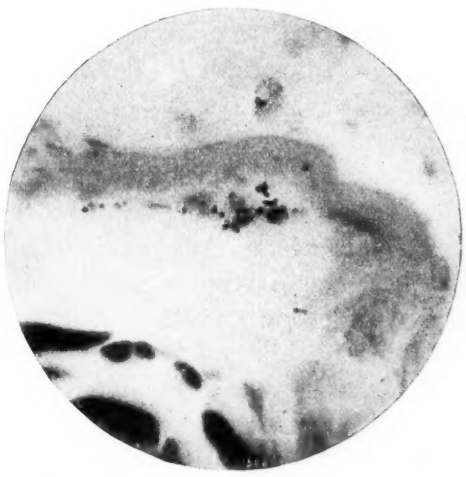

Fig. 3.—Diplococci within the lumen and in the wall of the blood vessel and within the leucocyte just outside of the blood vessel in the center of the tender fibrous nodule of the deep fascia from the left side of the neck. Gram-Weigert. X 1000.

lular infiltration (Fig. 2) and a large number within and surrounding a small sized blood vessel in the center of the fibrous nodule (Fig. 3).

A vaccine was prepared by heating the streptococci suspended in salt solution from the primary cultures of the pulp of the tooth and muscle and treating it with equal parts of the patient's serum for two hours at 37°F and over night

in the ice chest. This was used in the treatment of the patient. The first dose consisted of 25,000,000, and was followed by marked muscle pains, especially at the left side of the neck, by nausea, extreme exhaustion and slight fever. The subsequent injections were at first diminished and then gradually increased, aiming to give a distinct but not severe reaction following the injection. Dr. Grimes, who referred the patient to me, reported three months after the extraction of the tooth, that the patient has shown gradual improvement; the attacks are milder and of shorter duration, the intervals between attacks are longer, and there has been marked improvement in the general nervous tone.

ANIMAL EXPERIMENTS.

Intravenous injections were made into rabbits, guinea-pigs and dogs, and intraperitoneal injections into mice. The streptococcus as isolated from the pulp of the tooth was injected into 4 rabbits, 2 guinea-pigs and 2 white mice, all of which recovered. The primary culture after one animal passage was injected into 2 rabbits, 1 dog and 2 mice. The rabbits and dog recovered; the mice died. Thirteen animals were injected. In 10 of these circumscribed hemorrhages and edema opposite the roots of teeth or at the foramina of exit of the superior or inferior maxillary nerves were easily visible; in 7 there were lesions of the muscles, 4 of which were limited largely to the muscles of the left side of the neck; in 6 there were lesions of the pulp of the teeth and the superior or inferior dental nerves; and in 3 there were insignificant lesions of the kidney, 2 in the gall bladder and 1 in the stomach. The spleen, adrenal, endocardium, vagus and sympathetic ganglia and subcutaneous nerves were normal. No lesions were found in the nerves supplying hemorrhagic muscles. The diphtheroid bacillus did not produce lesions in the one rabbit and one mouse injected.

The streptococcus from the muscle in the first and second cultures was injected into 2 rabbits, 1 guinea-pig and 1 mouse, producing lesions of the muscles, chiefly of the neck and shoulders, in all. In the rabbits there were also hemorrhage and infiltration of the dental nerves, and gross lesions in the dental pulps and periosteum opposite the roots of the teeth. In 1 there were a few hemorrhages of the stomach, in the other, hemorrhages of the kidney; in the mice there was a mild peritonitis.

To the portion of the above cultures of streptococci left over and having marked affinity for the muscles, was added 0.5 per cent formalin. This was allowed to stand over night at room temperature, a portion put aside for direct injection; the rest was centrifuged and the bacteria washed in Ringer's solution. The former was injected intravenously into a rabbit in amounts of 10 c.c. on four occasions over a period of eleven days. The rabbit showed a moderate number of small hemorrhages in the muscles of the hips and shoulders and a few in the stomach. The washed suspension was injected one month later into 3 rabbits, each receiving the growth from 150 c.c. of the broth cultures. All died in twenty-four hours. The muscles in all had a boiled appearance, and those about the shoulders, neck and spine had large and small hemorrhages associated with edema; 2 had, in addition, a hemorrhage of the pulp of the teeth; and 1 a few hemorrhages about the joints, in the tricuspid valve and in the left inferior dental nerve. The lungs were free from hemorrhages.

Two cubic centimeters or approximately 500,000,000 of the heat-killed streptococci failed to produce lesions, but this may have been due to the small size of the dose. The filtrate of the formalinized cultures failed to produce lesions in the muscles following 3 injections of 10 c.c. each into 1 rabbit. Three injections into 1 rabbit over a period of eleven days of the slightly hemolyzing streptococcus from the pharynx were followed by moderate numbers of lesions in the muscles in the right side of the neck, the right elbow and right shoulder and in the intercostal muscles. The streptococcus from the stools in the second cul-

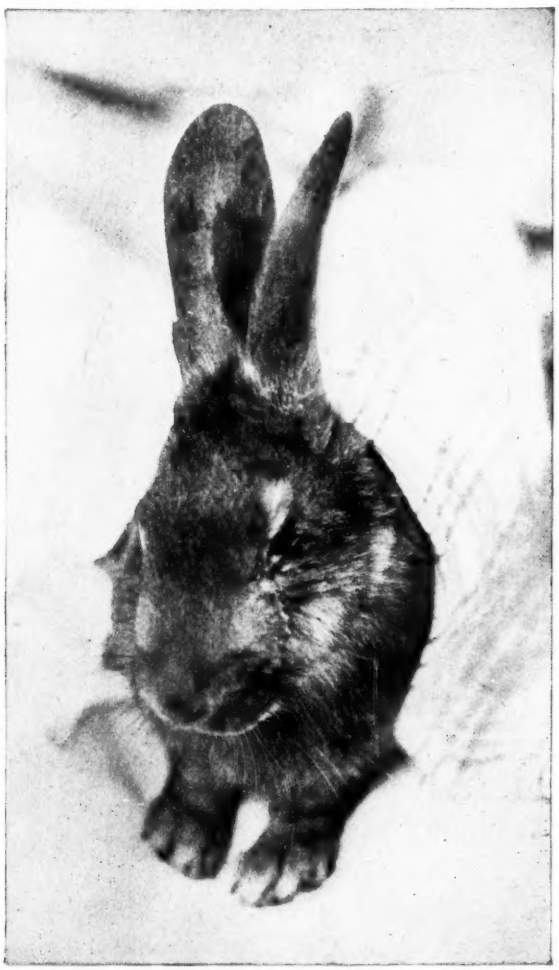

Fig. 4.—Rabbit (R 656) showing marked lacrimation of the left eye and swelling of the left side of the face forty-eight hours after the intravenous injection of streptococcus from the pulp of the extracted first upper left molar.

ture did not produce lesions. The living streptococci from the tooth, muscle, pharynx and stool in the first or second cultures, and after one animal passage, and the heat or formalin-killed streptococci, were injected altogether into 24 animals (15 rabbits, 3 guinea pigs, 1 dog and 5 mice). Of these 17 (71 per cent) showed myositis, 13 (54 per cent) lesions of the periosteum opposite teeth or at nerve foramina 12 (50 per cent) lesions of the pulp of teeth and 10 (42 per cent) lesions of the dental nerves.[2] Similar results have been obtained since

[2]The incidence of the lesions in the other organs corresponded with those given in my paper on "Elective localization of streptococci," Jour. Am. Med. Assn., 1915, 45, 1687-1691.

in 2 cases of myositis and arthritis with streptococci isolated from the diseased pulp of extracted teeth.

Previous to these experiments lesions of the pulp of teeth and the dental nerves were not usually looked for, but recently careful search for similar lesions in these structures has been made in numerous animals injected with streptococci from other sources. In three instances only were there found lesions of the pulp of teeth and dental nerves. Two of these animals showed myositis in addition. The details in the following experiments will serve to illustrate specifically the results obtained:

R 656.—Belgian hare, 1510 grams weight. January 19, 1916, injected intravenously with the growth from 30 c.c. of ascites-dextrose-broth of a pure culture of streptococcus from the pulp of the extracted tooth.

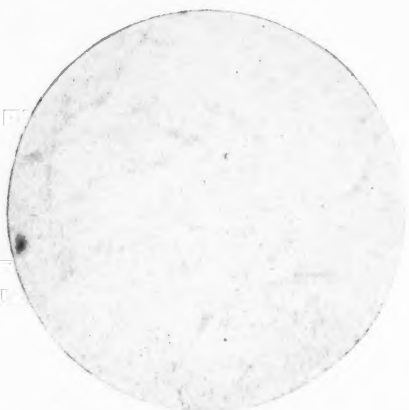

Fig. 5.—Diplococcus in an area of hemorrhage in the left superior dental nerve of rabbit shown in Fig. 4. Gram-Weigert. X 1000.

January 20. Seemed quite ill; respirations were accelerated; appeared to have pain in walking and promptly crouched when quiet. The hair was roughened and there was marked lacrimation of the left eye, but no swelling of the face.

January 21. Seemed much better; was more active but tremulous, and appeared nervous. There was lacrimation of the left eye and an easily recognizable swelling of the left side of the face (Fig. 4). Slight pressure over this area appeared to cause pain and the swelling could be easily felt. Chloroformed. A rather large number of linear hemorrhages in the skeletal muscles, chiefly in the tendinous portions of the flat muscles of the shoulder and deeper muscles of the left side of the neck and of the front extremities were found. There were no lesions of the muscles of the hind extremities, the dorsal and lumbar regions of the spine, nor of the intercostal muscles and diaphragm. On removing the skin on the left side of the face, marked edema, infiltration and hemorrhage of the subcutaneous tissue, the fascia, the muscles and the periosteum, were found The hemorrhages in the periosteum opposite the molars appeared to be the center of the edematous area. The hemorrhagic infiltration extended to the under surface of the orbit. The pulp of the left third and fourth upper molars was found to be edematous and hemorrhagic. The hemorrhages were small and punctate and were not found in the pulp of the 2 corresponding teeth on the

opposite side. On dissecting away the soft tissues of the lower jaw, it was found that hemorrhages of the periosteum had occurred opposite the apices of the right lower incisor, and the first and two last molars, the second left lower molar, and surrounding the right mental foramen similarly to the lesions shown in Fig. 6. The pulp of the teeth surrounded by hemorrhages in the periosteum was found to be edematous and hemorrhagic, whereas 3 adjacent pulps appeared

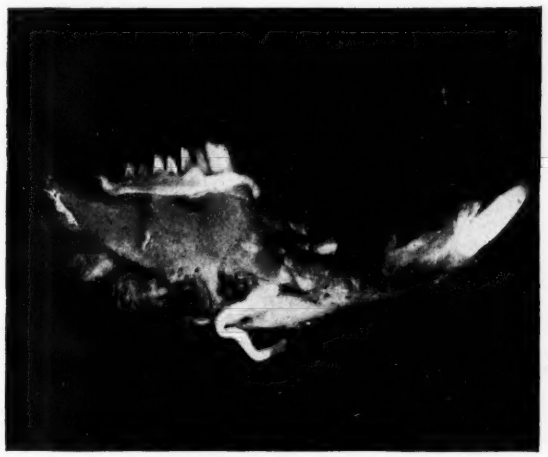

Fig. 6.—Left lower jaw of rabbit (R 659) injected three days previously with 5 c.c. of twenty-four hour tissue-ascites-fluid culture of the streptococcus from the tooth. Note the edema and hemorrhage in the periosteum opposite the root of the canine and surrounding the inferior dental nerve at the foramen of exit. X 2.

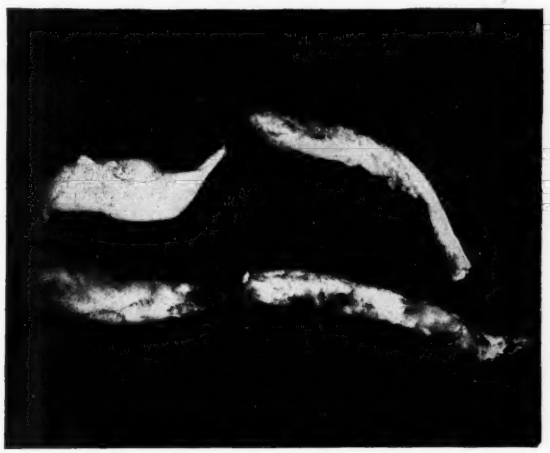

Fig. 7.—The pulp of the inferior canine and inferior dental nerve from dog (D 412) two days after an intravenous injection of the streptococcus isolated from the hemorrhagic pulp of the second upper left molar. Note the numerous large and small hemorrhages in the pulp of the left lower pulp and nerve. X 2.

normal. The left superior dental nerve was extremely hyperemic and a number of small hemorrhages were found in the sheath. The only lesions of the viscera were 3 small hemorrhages in the mucous membrane of the pyloric end of the stomach and 3 small subserous hemorrhages at the fundus of the gallbladder.

January 23. Blood-agar plate cultures of the blood produced 1 colony of streptococcus; of the emulsions of the pulp of teeth 5 and 18 colonies respectively. Cultures in ascites-dextrose broth from the emulsions of the pulp of 2 teeth, of

the hemorrhagic muscle, of the edematous tissue over the jaw and of the hemorrhagic periosteum, showed a short chained streptococcus.

Sections of the edematous tissue over the left jaw showed extreme hemorrhage, edema and beginning leucocytic infiltration. In the pulp of 2 teeth from which sections were made, were large and small hemorrhages chiefly beneath the layer of odontoblasts, and in the left superior dental nerve were small areas of hemorrhage in the sheath. Sections of hemorrhagic areas in the scapular muscles showed marked hemorrhage between the muscle fibers, separation and fragmentation of the latter, and slight leukocytic infiltration. Gram-Weigert stains showed diplococci in or adjacent to the hemorrhagic areas in the edematous periosteum, in the muscle from the scapula, in the pulp of the teeth, and in the left superior dental nerve (Fig. 5).

D 412.—A white and black dog, weight 9:5 kilos. January 22, injected intravenously with the growth from 90 c.c. of ascites-dextrose broth of the streptococcus from the hemorrhagic pulp of a tooth of the above rabbit.

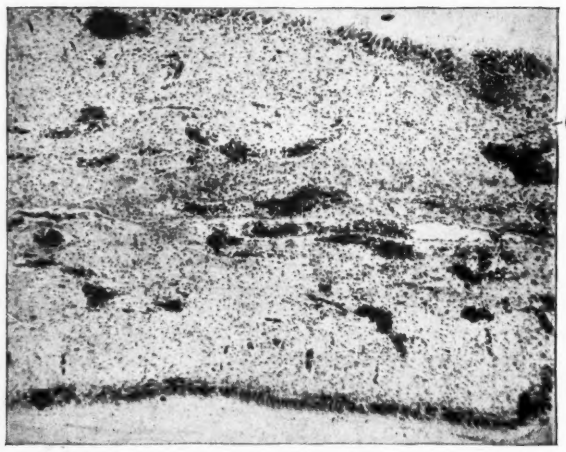

Fig. 8.—Section of the pulp of the left lower canine shown in Fig. 7. Note the marked hyperemia and the large and small hemorrhages. Hematoxylin and eosin. X 60.

January 24. Seemed well; was active; no swelling of the face; no tenderness over joints nor muscles. Chloroformed. The left inferior dental nerve was found to be edematous and hyperemic and contained a number of large and small punctate hemorrhages (Fig. 7). The pulp of the corresponding canine tooth likewise appeared edematous and contained numerous punctate hemorrhages. The corresponding nerve and pulp on the opposite side appeared normal (Fig. 7). There were similar but less marked lesions of the left superior dental nerve and pulp of the canine tooth. The first upper and lower molars were examined and only the first left lower molar showed unmistakable hemorrhage. The muscles were free from visible lesions except for a few hemorrhages in the flat muscles under the scapulæ. In a painstaking examination of all the organs no other apparent lesions were revealed.

January 25. Blood-agar slants made from the blood were sterile.

Sections for microscopic study were made from the left inferior dental nerve, from the pulp of the teeth mentioned, and from the superior maxillary

nerve. Hemorrhages and beginning leucocytic infiltration were found in the pulp of the left inferior canine (Fig. 8) and a small number of hemorrhages in the pulp of the first left lower molar, but practically none in the others. These hemorrhages were most numerous immediately beneath the layer of odontoblasts and at the distal portion of the pulp (Fig. 8). Sections of the left inferior dental nerve showed marked edema, a moderate leucocytic infiltration and a number of large and small hemorrhages chiefly in the sheath (Fig. 10). There

Fig. 9.—Diplococci, singly and in short chains, within and outside leucocytes, adjacent to the area of hemorrhage shown at *a* in Fig. 8.

Fig. 11.—Diplococci and double chain of streptococci in the hemorrhagic and infiltrated area (*a*) in the sheath, shown in Fig. 10.

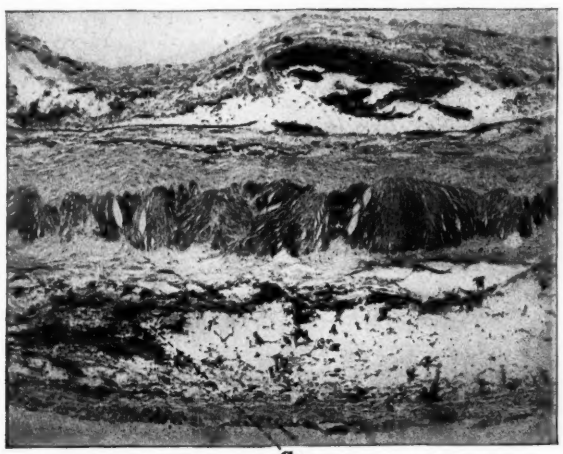

Fig. 10.—Section through the hemorrhagic area in the left inferior dental nerve, shown in Fig. 7. Note the marked edema and large and small hemorrhages and leucocytic infiltration of the sheath. Hematoxylin and eosin. X 60.

were no lesions in the left superior maxillary nerve. Gram-Weigert and methylene blue stains for bacteria showed scattered diplococci and at times chains of diplococci in and adjoining the hemorrhagic areas (Figs. 9 and 11). In one instance, a mass of diplococci surrounded by erythrocytes was found just outside the wall, and 2 diplococci in the wall of a small blood vessel. In a number of instances the diplococci were found within leucocytes and in what appeared to be endothelial cells. No bacteria could be found in the normal portions of the pulps and nerves showing lesions, nor in those free from lesions.

P 155.—White guinea-pig, weight 320 grams. February 19, injected intravenously with the growth from 30 c.c. of ascites-dextrose broth of the streptococcus isolated from the muscle of the patient.

February 21. Seemed quite well, but appeared to be muscle-sore. Chloroformed. Numerous small hemorrhages associated with edema in the triceps muscles and a moderate number in the muscles of the left shoulder and a few hemorrhages in the deeper layer of the muscles of the left side of the neck

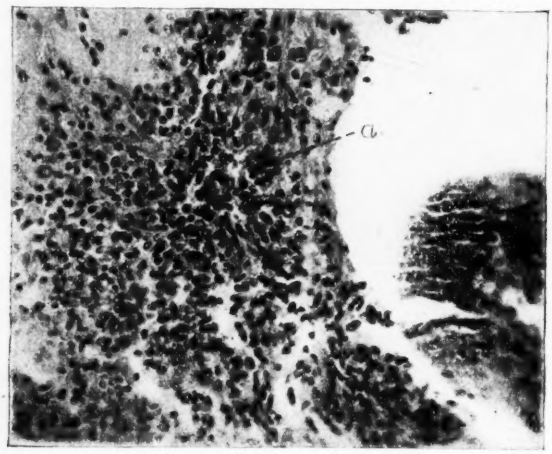

Fig. 12.—Section of the dental pulp of the left upper molar in guinea pig (P 141) injected two days previously with the streptococcus from the pulp of the patient's tooth. Note the marked leucocytic infiltration and hemorrhage. Hematoxylin and eosin. X 240.

Fig. 13.—Diplococcus in infiltrated area (*a*) shown in Fig. 12. Gram-Weigert. X 1000.

were found. There were no lesions of the dental nerves but the pulp of the two left upper molars was extremely hyperemic and contained distinct hemorrhages. There were no other findable lesions.

February 24.—Cultures from the blood in ascites-dextrose broth were sterile.

Sections through the areas of hemorrhage in the scapular muscle showed marked extravasation of blood corpuscles, leucocytic infiltration, separation and necrosis of muscle fibers (see Fig. 14 illustrating similar lesion in triceps muscle).

Sections of the pulp of the left first upper molar showed a number of small hemorrhages while in those of the superior maxillary and right superior dental nerve there were no lesions. Gram-Weigert and methylene blue and eosin stains showed a few scattered diplococci in the hemorrhagic and infiltrated area in the muscle and adjacent to the hemorrhages in the tooth-pulp (Fig. 15).

Fig. 14.—Section of the left triceps of guinea pig (P 155) injected two days previously with the streptococcus from the muscle of the patient. Note the marked hemorrhagic and leucocytic infiltration and separation of muscle fibers. Methylene blue and eosin. X 140.

Fig. 15.—Diplococcus in infiltrated area shown in Fig. 14. Gram-Weigert. X 1000.

THE STREPTOCOCCUS.

The streptococcus isolated from the dead pulp of the tooth, the muscle, the pharynx, and the stool, produced small, round, slightly elevated grayish-brown, non-adherent, rather dry, colonies on aerobic blood (human) agar plates. In broth it produced a diffuse turbidity with a small amount of flocculent sediment at the end of forty-eight hours. It acidified and coagulated milk. In liquid media it grew in short chains and diplococci. In many instances, the single members of the diplococci were quite round and resembled staphylococci. The strains from the tooth and muscle were freely susceptible to phagocytosis

and the virulence was of a low order. The streptococci from blood agar slants in salt solution used as a vaccine resisted 60°C. for thirty minutes on consecutive days, while after the third heating the subcultures remained sterile. The blood of the animals soon became sterile, and nearly all recovered promptly from the effects of injection. The organism resembled very closely the streptococci that

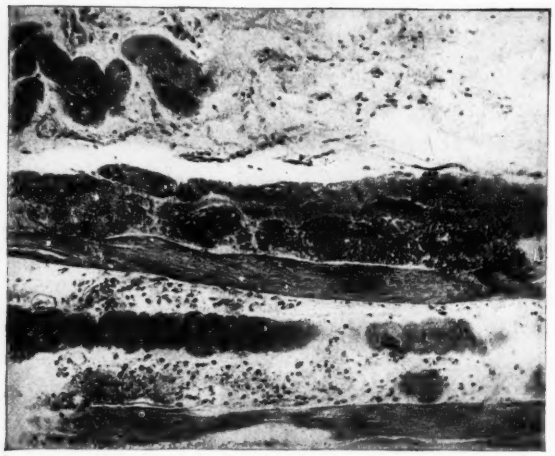

Fig. 16.—Section of the left trapezius in rabbit (R 660) forty-eight hours after intravenous injection of the streptococcus from pulp of the left upper molar in rabbit shown in Fig. 4. Note the marked edema, leucocytic infiltration, hemorrhages and the disintegration of the muscle fibers. Hematoxylin and eosin. X 120.

I have isolated from other cases of myositis and strains from other sources having affinity for muscles.

In Table 1 is given the fermentative power of the strains isolated from the pulp of the tooth, the muscle, the pharynx, and the stool. It is seen here, as has been found to be the case with other streptococci, that there is little parallelism between pathogenicity and the degree or range of fermentative powers.

TABLE 1

FERMENTATIVE POWERS OF THE STREPTOCOCCUS*

Streptococcus	Dextrose	Lactose	Saccharose	Maltose	Raffinose	Mannite	Salicin	Inulin
Tooth pulp	2.4	1.5	0.9	1.9	0	1.3	2.0	0
Pharynx	1.9	1.8	0	1.6	1.8	1.0	0	0
Muscle	1.5	1.2	1.5	1.3	0	0	0	0
Stool	2.9	2.3	1.1	3.2	0	0	2.3	0

*The standard sugar-free broth containing the usual amounts of the various carbohydrates was used in the fermentative tests. The cultures were incubated 72 hours. The figures indicate the number of cubic centimeters of normal tenth sodium hydrate required to neutralize 5 c.c. of the broth culture, phenolphthalein being used as an indicator.

SUMMARY.

A streptococcus having peculiar properties was isolated from the dead pulp of the left upper first molar in the region where the attacks of pain usually began. The streptococcus was also demonstrated in the sections and isolated from the

infiltrated deep fascia and muscles of the left side of the neck. A similar streptococcus was isolated from the pharynx and stool. This streptococcus was proved to have elective affinity for the pulp of teeth, dental nerves and muscles in animals. It was repeatedly isolated from and demonstrated in the experimental lesions in animals whose blood was sterile; the lesions were again produced on reinjection and the streptococcus again isolated. Many animals appeared to be in pain and 1 rabbit (Fig. 4) had marked swelling and tenderness over the left upper jaw. This affinity was proved absent in the diphtheroid bacillus and *Bacillus fusiformis,* which also were isolated from the pulp of the tooth, and in the streptococcus broth culture filtrate. Streptococci from other sources rarely cause lesions in the pulp of teeth and dental nerves. The phagocytic power of the patient's blood following the attack over the strain from the tooth was twice that of comparable normal blood.

These results would appear to warrant drawing the conclusion that the attacks of pain in the face in this patient were due to a streptococcus infection of the sheaths of the dental nerves, and that the pain, swelling, tenderness and spasm of the muscles of the neck were due to myositis and fibrositis—the result of infection by this streptococcus. The demonstration of living streptococci in the pulp of the tooth and in the fascia and muscle during quiescent intervals is significant and may explain the recurrence of the attacks. The cavity in the tooth containing the dead pulp, which was originally infected from the mouth, judging by the character of the filling and of the bacterial flora, was quite unable to heal for mechanical reasons. The contents of the cavity appeared to afford a culture medium for the growth of the streptococcus. From stimulation of the defensive mechanism in the patient during the attacks, active growth appeared to be held in check and the symptoms disappeared in consequence, only to reappear later from recurrence of active growth and localization of the streptococci when the immunity was low.

The improvement in the patient since extraction of the tooth appears to be due to the removal of this focus and to prolonged artificial stimulation of the defensive mechanism by means of the autogenous vaccine, which, it is hoped, will lead to the destruction of all the streptococci in the muscle and dental nerves, and result in the ultimate recovery of the patient. However, the isolation of this streptococcus from so many places, indicates that complete recovery will probably be difficult.

PLEA FOR A MORE GENERAL USE OF THE X-RAY

By Dr. Harold B. Thompson, Seattle, Wash.

THE value of x-ray in the diagnosis of dental pathology has been appreciated by a few men in both the dental and medical profession for a number of years. More recently the increase of x-ray equipment, together with considerable literature on the subject, both in professional and lay periodicals, has wonderfully broadened the field and increased the application of this modern diagnostic aid.

There are still a large number of men in both the dental and medical fraternities who do not avail themselves of this help in diagnosis, at least to a sufficient extent for their own welfare. Whether this neglect is due to ignorance, habit, or an axaggerated opinion of one's own diagnostic ability, it is certainly inexcusable. There still remain a few physicians who will volunteer to treat fractures without the aid of the x-ray, even when radiographs are available; but through slow education, the use of the x-ray has become so universal, that the failure to procure an x-ray examination in fractures, when possible, now constitutes a prima facie cause for an action of malpractice. It is only a question of time, if the time has not already arrived, when the failure of the dentist or physician to avail himself of the aid of the x-ray in dental conditions, will render him liable for malpractice to the same extent. The use of the x-ray then, constitutes a form of insurance against malpractice suits, and the premium is paid by the patient.

The work of Dr. Rosenow along the line of bacterial origin of arthritis, ulceration, appendicitis, gall bladder diseases, etc., is familiar to all in the profession. So much has appeared in the lay literature recently along this line, that the public is beginning to demand an x-ray examination of the teeth, sometimes even before the physicians or dentists. Although all my work is referred work, I have recently had several cases appear for dental radiographs without being referred, when the symptoms were confined to general joint conditions or to the abdominal organs. It is certainly more to the credit of the attending man to anticipate a patient's wishes in this regard than to have the course of action suggested by the patient.

It is often a desire for economy on the part of the attendant when he does not ask or insist on a radiograph. Numerous experiences have shown me the fallacy of this line of procedure. One dissatisfied patient can do more harm than several pleased ones can do good. A patient who has been treated for several weeks or even months by one man and then changes to another, who refers the case for a radiograph and with its aid completes a cure in a short time, has good reason to become a "knocker." A patient's health is his most valued possession, and he will appreciate your interest in his case as shown by your desire for all the information possible, even though the radiograph gives no material aid.

I have intentionally omitted in the body of this article, an enumeration

Fig. 1-*A*.

Fig. 1-*B*.

Fig. 1.—Typical apical abscesses.

Fig. 2.—Absorption of tip of root and decalcification of surrounding alveolar process.

Fig. 3.—Small area of rarefaction (apical abscess) at tip of lateral incisor.

Fig. 4.—Small areas of rarefaction at tips of right middle and lateral incisors.

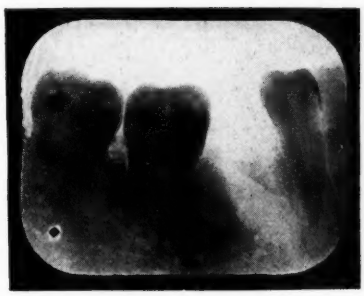

Fig. 5.—Small fragment of alveolar process left after extraction of tooth and causing persistent sinus.

of the specific class of cases in which the x-ray has proved of inestimable value, as this has been ably covered time and again in recent literature. My plea is more for a general line of attack, than a plea for the use of the x-ray in any specific class of cases, and you will find this general attitude of availing yourself of all possible aids in diagnosis to rebound to your benefit.

Fig. 6.—Decalcification of alveolar process surrounding root of crowned pivotal tooth from pyorrhea.

Fig. 7.—Decalcification at surface of alveolar process, extending downward at side of canine and appearing also at tips of middle and lateral incisors, pyorrhea.

Fig. 8.—Unerupted canine.

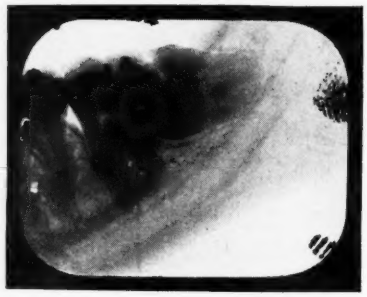

Fig. 9.—Impacted third molar causing "neuralgia."

Fig. 10.—Unerupted canine causing "neuralgia" by pressure against the root of the lateral incisor.

Fig. 11.—Incomplete filling of root canal.

A recent case which came under my observation, shows the value of another laboratory test, but the application is the same. A specialist sent a case to the hospital one day and engaged the operating room for the following morning, intending to do an extraction of all the teeth for an aggravated case of pyorrhea. The young interne at the hospital noticed the peculiar pallor of the patient and

Fig. 12.—Showing acute curve in root, giving excuse for drilling through side of tooth.

Fig. 13.—Hole drilled through side of tooth with filling protruding, causing necrosis of alveolar process.

Fig. 14.—The dentist has drilled through the side of the root and then inserted a root canal filling which has caused necrosis of the bone. In attempting to remove this filling a small pair of forceps has been broken off outside the tooth.

Fig. 15.—Protrusion of root canal filling, causing necrosis.

Fig. 16-*A*.

Fig. 16-*B*.

Fig. 16.—Stereoscopic radiographs showing the direction of growth of unerupted teeth.

took a blood smear, which showed an advanced typical case of leukemia. Needless to say the operation was postponed, and well it was, for the patient died within a week, and his death would probably have been attributed to the operation, had it been done.

The accompanying illustrations will serve to call to mind some of the more obvious specific cases in which great benefit may be expected from the use of the x-ray.

My plea for a more general use of all possible aids in diagnosis, particularly that of the x-ray, as it has a much greater field in dental work than any other laboratory method, may be summarized as follows:

1. A more general use of the x-ray will allow a more positive diagnosis with consequent more particularized treatment, and better and quicker results.

2. The more general use of the x-ray is a form of insurance against malpractice suits with the premium paid by the patient.

3. The risk of having your patient become a "knocker" is transferred to the man who fails to use the x-ray.

4. The appreciation of your thoroughness when the patient is convinced that you are using every means at your disposal to alleviate his condition, will prevent dissatisfaction in many cases and engender a confidence which even unfortunate results will not be able to overcome.

News and Notes

Dr. E. Santley Butler, practice devoted exclusively to orthodontia, has announced removal of offices from Room 704 to Suite 605, 576 Fifth Avenue, New York City.

* * * * *

Drs. Sturdevant and Dinham, practice limited to orthodontia, announce their location at 919-920 Selling Building, Portland, Oregon.

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Dr. Blaine Truesdell announced the removal of his offices to Suite 1112 First National Bank Building, Omaha, Nebraska. Practice limited to orthodontia.

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EDITORIALS

The Universal Regulating Appliance

REGULATING appliances are mechanical devices for exerting force on the malposed tooth for the purpose of creating cell activities thereby causing the tooth to assume its proper position in the line of occlusion. A universal regulating appliance is one that is capable of being used to the best advantage upon all cases. The ideal regulating appliance must possess certain requirements, the first of which is efficiency. It must be capable of doing the things which it is intended to do. It must exert force upon the malposed tooth with the result that cell activity will occur and the tooth be moved into the line of occlusion. After efficiency, there are other things to be taken into consideration with reference to making an ideal appliance. One of the requirements of any appliance is that of stability and anchorage, by which we mean the appliance must be so attached as to be capable of exerting the desired force. It must also be so attached that it will exert force in the proper direction so as to produce the proper cell activity and tooth movement.

In going through orthodontic literature we find that there are several appliances which seem to approach the ideal. There are several styles of appliances upon the market which, in the hands of certain men, will easily accomplish the desired result. These appliances may be divided into two groups, known as "fixed" and "removable," each one of which has certain advantages and disadvantages. When we consider the radical mechanical difference between those two appliances it seems almost an impossibility to talk about any one appliance which will fulfill the requirements possessed by both the "fixed" and "removable." It has been stated by Dr. Eby that the regulating appliance of the future will be one that will embody the advantages of both the fixed and removable, combining them into an appliance which might be termed the "fixed removable" type. In studying the results of orthodontic treatments of times past, we might say that so far as mechanism and the construction of an appliance in regard to tooth movement is concerned, we have appliances which are ideal. We have several styles of appliances which seem to be able to correct any case of malocclusion encountered. In other words, if the movement of the malposed tooth was the only thing to be considered we would be able to select several styles and kinds of appliances, any of which would produce that movement. However, the movement of the malposed tooth is not the only thing to be desired as has been revealed to the sorrow of some men. In considering an ideal regulating appliance, we have to consider the material from which the appliance is constructed. When we take up the question of material we are immediately confronted with one of the biggest problems we have to contend with from the standpoint of ideal conditions. Up to the present time we have no metals or materials which may be considered ideal. A metal which possesses one requirement to a very high degree of efficiency will be decidedly lacking in another. For instance, several years ago the majority of regulating appliances on the market were made out of German silver. German silver possesses a great many ideal characteristics, the principal one of which is the ease with which it may be worked and also its antiseptic properties. Looking over the large number of cases which have been treated with German silver appliances in the past, we find some very nice results have been obtained; we also find some of evil effects. We find that in a great many instances some of the anchor teeth were discolored, were turned black from a black stain or oxide very difficult to remove. In checking up these results, however, we are forced to admit the actual amount of decay which occurred in the mouths of those treated with German silver appliances was comparatively slight. However, as a result of the tarnishing of the German silver and as a result of its appearance, it was not satisfactory from an esthetic standpoint. Therefore, a large number of men began using gold and platinum and iridio-platinum, because the appliances were more pleasing in appearance. In other words, they sacrificed the antiseptic properties in the metal for the esthetic, with the result that an examination of the cases treated by gold and platinum and iridio-platinum appliances show a very great loss of tooth structure. In other words, the amount of decay which has occurred with the use of the iridio-platinum and gold and platinum appliances is far in excess of that which occurred in the use of the German silver appliance. To eliminate this decay which resulted from gold and platinum appliances, some men began advocating the banding of every tooth that the

appliance would touch, advocating a layer of cement to protect the teeth. The use of so many bands on the teeth to prevent them from decaying defeated the purpose of the better appearance of the noble metals as compared to German silver, for nothing is more unsightly than a large number of bands on anterior teeth.

In using bands there is always the ultimate danger of the bands resting against the tissue, and we now have oral prophylactic specialists who condemn orthodontic treatment because of the injuries to the gingival tissues produced by bands. The facts remain that if one band occasionally injures the gingival tissue, that injury is more apt to occur where a large number of bands are used than if very few bands were used. Even in the construction of the removable appliance which does not employ any bands, we have to take particular care to avoid injury of the gingival tissue with the gingival extension which is made to go under the lingual convexity to hold the appliance; but there is very little liability to decay providing the appliance is carefully cleaned and taken care of as it should be. However, there is one disadvantage in the removable appliance,—the placing of the appliances on the lingual side may interfere with the speech of the patient. Therefore in this respect the removable appliance is not ideal.

We have mentioned that appliances were changed from German silver, to gold and platinum, and iridio-platinum for the esthetic effect, which brings out the point that the esthetic effect or appearance of the appliance is an important thing to be considered. A great many patients do not care how efficient the appliance is from a mechanical standpoint, if it looks well, and they prefer a less efficient appliance to one that is conspicuous. Therefore we have to consider the question of appearance in regard to regulating appliances, and the ideal appliance must be so constructed as to be inconspicuous if not entirely out of sight. In regard to inconspicuousness, the majority of removable appliances have an advantage over a large number of fixed appliances.

Another requirement of the ideal appliance, about which many statements have been made is that it must produce physiological cell activities. Just what the activities of cells are as a result of the regulating appliance is not exactly understood. We do not know, however, that the results of some of these appliances have not been satisfactory from the standpoint of cell activity. We have known of several cases where the roots of the teeth have absorbed for some reason or other during tooth movement. We do not know exactly why this was, except as a general statement, that the proper cell activity was not produced. The question remains, "What is the proper cell activity to be expected from regulating appliances?" The answer to this question can only be given in a general statement: namely, that the cell activities produced by the regulating appliance should be in keeping with the same cell activity that occurs as a result of normal development. In other words, malposed teeth moved by regulating appliances should follow as nearly as possible the movement produced by a tooth during the process of eruption. To approach this style of tooth movement, the appliance must be so constructed that the teeth will be free to respond to the forces of mastication and not lashed or bound rigidly by any fixed or firm appliance. Also during the eruption of the majority of teeth they do not travel in a straight line, they do not travel bodily in one direction, but tip more or less during their movement. If you will examine the position of the upper teeth

before eruption, as they lay in their crypts, it will be seen that they must travel buccally a considerable distance and a large amount of that traveling is the result of tipping. The lower molars and premolars as a rule travel lingually to a certain extent which also is the result of tipping. This lingual movement of the lower molars is especially true in the deciduous teeth, although the permanent teeth do not travel lingually as much as the deciduous teeth. Any appliance then that exerts pressure to produce physiological cell activity will be one that will not interfere with the individual development or growth of any one tooth, neither will there be undue pressure brought to bear on the teeth in any one particular direction.

We have outlined a number of the requirements of the ideal appliance, and in a general way, stated some of the difficulties which are encountered. With the large variety of malocclusions which we are called upon to treat at the present time it seems that the best plan is not to look for a universal regulating appliance, but choose the appliance which more nearly approaches the ideal in that particular case. An appliance which may be desirable in one individual or case of malocclusion would not be so ideal in another case. Therefore, we believe at the present time, that the greatest service will be rendered the patient if the orthodontist will become able to analyze regulating appliances from a mechanical standpoint, and consider what is required in the treatment of the particular case in hand and select the appliance from the standard types which have been proved worthy and useful. We do not believe that it is necessary to make and design a separate appliance, based on new mechanical principles for every case of malocclusion which we treat. Any regulating appliance regardless of whether it is a fixed or removable variety exerts pressure upon the teeth in only two ways, either pushing and pulling, or by a combination of the two, which is twisting. After an appliance is secured which does that, there only remains the selecting of an appliance with some means of properly attaching it to the malposed tooth to obtain the desired force to produce the mechanical stimulation which will cause the cells to respond in a physiological manner. We also believe it is a mistake to say any one style of appliance, because it has been advocated by a group of men, is the only kind to use. We must realize that in certain instances other appliances might better serve the need of the case, be more comfortable to the patient, and be less conspicuous and more hygienic. There are even instances when a simple appliance will do the work as satisfactorily as a more complicated one.

Therefore, the question of the regulating appliance of the future remains for the individual operator to be able to analyze his case so as to be able to select the best appliance for the particular case; and possibly, far in the future, we may evolve an ideal regulating appliance.

Is Our Dental Literature Free from Commercial Influence?

THERE is one question which arises in the comparison of the literature of the dental profession with that of the medical profession and other scientific bodies. That question is whether our dental literature is controlled or influenced by commercial houses, or whether commercial influence is exerted upon the

publication of our articles; for the majority of our dental journals, those which have the largest circulation and which may be said to be representatives of dental literature, are journals controlled by trade houses. It is a lamentable fact that the dental profession, at the present time, has but few journals that are not influenced by trade houses or under the control of houses interested in selling dental goods.

We are aware of the fact that the medical profession passed through a similar stage several years ago, before the *Journal of the American Medical Association* reached its present standing. This resulted in the improvement of medical journals controlled by publishing houses, and the elimination of trade journals. We now have high class scientific journals which have no commercial appliances for sale and which also are free from, or not interested in, the selling of medical supplies.

We have often wondered whether the dental journal that is controlled and published by a house whose sole object is the selling of dental supplies is published in the interest of the profession, or whether it is not published for the advertising of their own products. We are aware of the fact that editors of the dental journals have very high ideals, and, so far as the ideals of the editors, or the editors themselves, are concerned, we have no criticism. However, it has been brought to our attention that several of the editors of dental journals are heavy stock-holders in the supply houses that publish journals. We, therefore, wonder if those particular editors could serve the interests of the profession as well as if they were not interested in the selling of dental supplies. We wonder if they would publish in their journals papers written by scientific men criticizing very severely some of the articles in the sale of which the supply house is interested, and which are advertised very extensively in the advertising department of the journal. It might be that our dental editors would wish to do so, but we very seriously doubt that the supply house or the publishers of the journal would allow such a thing to occur. It has been shown that there are several very extensively advertised cements on the market which, by scientific analysis, do not carry out the claims made by their manufacturers. We, therefore, wonder if the publishers would allow a criticism of such cements from a purely scientific standpoint to appear in their journal at the same time their advertising pages would be highly lauding the advantages and wonderous properties which they possess. We believe that the dental editor would be more able to serve the interest of the profession from a scientific standpoint if his sole business was the editing of the journal, and if he was not interested in the sale of dental articles.

In some journals, articles are published as scientific which are really only advertisements for some material or appliance. Papers are also often written for the purpose of selling articles which are advertised in the pages of the journal. We remember recently a very prominent dental trade journal which contained a featured paper on the first pages describing a new appliance. This particular appliance may have a great many virtues, but it is often plain to see that some papers are written to sell appliances. A great many claims are made for that purpose. In the same issue of that trade journal there appeared a featured advertisement calling attention to the wonderous qualities of an appli-

ance and referring back to a paper published as a scientific paper. Since that time the supply house has sent out advertisements broadcast in which they include reprints of the paper, which are mailed along with the catalogue of the appliance. The advertisements of the appliance are constantly referring to the paper which was published in the journal. Would the same prominence be given to a paper which presented scientific criticism of the aforesaid appliance? Would they publish a criticism of an article which they widely advertised? We believe that commercialization of scientific papers from a professional standpoint is very poor policy. If papers were written showing the weakness of widely advertised articles, would the publishers be as willing, for the scientific advancement of orthodontia, to give a paper criticizing some of their appliances the same publicity they would give the paper calling attention to the virtues of the appliance We believe that the virtues of any article should be published broadcast, but we also believe that it should be published in a scientific manner and not in a commercialized manner.

If dentistry is a science, it must have journals that are willing to publish scientific papers even if the papers criticise materials and appliances that are products of the publisher. It has been called to our attention that there are some trade journals that will not illustrate any style of an appliance unless manufactured by their own house. This again is a commercialization of scientific literature which handicaps the profession, and which the dental profession should remember, contributes to the weakness of their literature as compared with that of the medical profession.

The Small Gauge Regulating Appliance

SEVERAL years ago the majority of appliances or alignment wires placed upon the market were made of 16 gauge material. The 16 gauge arch was the universal regulating appliance which at that time was made principally of German silver or some other alloy. When it became the common plan of treatment to correct malocclusion of the deciduous teeth, the 16 gauge arch was found to be too large. There then was a tendency towards the use of 18 gauge arches and at that time the 18 gauge was the smallest arch placed upon the market. Since that time arches have been manufactured in all gauges varying from 16 to 20 and some even as small as 36 thousandths of an inch. As a result of the use of the small gauge arch, some men have been inclined to discard the large gauge in favor of the small, claiming the small gauge is less annoying to the patient and consequently should be used in all cases. We are willing to agree that the small gauge arch up to 19 or 20, or even 25 or 36 thousandths of an inch, may have advantages in some cases; but, it by no means replaces the large arch, in some cases, if the most efficient regulating appliance is desired. The small gauge arch has its limitations as well as its usefulness and it should by no means be considered the ideal appliance for all conditions.

The small gauge arch can be used satisfactorily in those cases of malocclusion which require a reciprocal anchorage, in those cases of neutroclusion where all the teeth have to be expanded an equal amount; it is ideal because of

its delicate spring which works for a considerable length of time without readjusting. We find in other types of malocclusion that it possesses several disadvantages. One disadvantage of the small gauge arch is that it must be fitted very close to the teeth, for owing to its small diameter, it is much more liable to injure the cheek than an arch of a larger size. If the patient lies on the side of his face during the night the small gauge arch is more liable to cut into the cheek than a 16 gauge arch. Owing to the small gauge arch possessing a large amount of spring it is contraindicated in those cases where the point of attachment is far removed from the anchorage. In other words, if the small gauge is used on cases where it is necessary to move the four anterior teeth forward without any expansion in the molars or premolars, it possesses disadvantages because of the tendency to spring buccally between the attachment on the incisors and the molar anchorage. The same trouble would recur if the small gauge arch of 25 or 36 thousandths of an inch was being used to open up the space for a premolar by carrying the anterior teeth forward by the action of the nut. If we were going to have stationary anchorage on one side and primary anchorage on the other, or if our case was one that required expansion in the molar region on one side and the holding of the molar stationary on the other, it would be difficult to secure stationary anchorage with the small gauge arch owing to the elasticity which would permit the arch to spring. Likewise, in the use of the intermaxillary anchorage where we desire the backward movement of the teeth, as in the treatment of a mesioclusion case, there is a great tendency for a small gauge arch to spring between the molar anchorage and the attachment of the intermaxillary rubber. These are only a few of the conditions where a small gauge arch is contraindicated, but for the benefit of a large number of men, especially the younger men, who may become over enthusiastic over the use of the small gauge arch, we are mentioning these disadvantages. Dr. Lourie has stated that the shorter the regulating appliance between the points of attachment, the smaller the gauge can be. In other words, there is a limit to the smallness of the gauge of the alignment wire where it is lingual or labial, and this limit depends upon the nature of the teeth movement to be accomplished, the direction from which the force is to come from the appliance, whether it is to be entirely a spring force or a pushing force derived from the action of the nuts, whether the attachments to the appliance are close together, and whether reciprocal anchorage or stationary anchorage is to be used.

The advantages and disadvantages of the small gauge arch should be studied from a scientific standpoint, and it will be found useful in one case and a hindrance in another.

Dr. William Goode

DR. WILLIAM A. GOODE, Orthodontist, San Diego, California, was drowned in the Cuyamaca Lake, Sunday, November 19th, when his light duck boat was capsized by a strong wind. Dr. Goode with a number of San Diego physicians and dentists had gone to the lake Saturday night for an outing over Sunday. Dr. Kerch and Dr. Goode were in a light duck boat which

was capsized by a large wave about two hundred yards from shore. After clinging to the boat a short time, Dr. Goode, who was very athletic, started to swim to shore. He had gone about half way when he disappeared, probably as a result of the chilly water and also being weighed down with heavy hunting clothes and ammunition. Dr. Kerch was rescued by hunters in another boat, and they attempted to reach Dr. Goode when he sank.

Dr. Goode was thirty-four years of age, having lived in San Diego twenty-two years. He was a graduate of the Sherman Heights School, the San Diego High School, and Pomona. While a student at Pomona, he was a member of the Pomona football team. He graduated from the Northwestern University Dental School in 1910, and took a postgraduate course in the Dewey School of Orthodontia.

Dr. Goode leaves a widow, who, before her marriage, was Miss Ethel Speaker, physical director of the San Diego High School.

Dr. Goode had a very brilliant future, he was very well esteemed by both the medical and dental professions. While he had only shortly taken up the practice of orthodontia, from the success he obtained in other lines, we are sure that orthodontia loses a good man by the untimely death of Dr. Goode.

A New Fourth Edition of Prinz "Dental Materia Medica and Therapeutics"

THE dental profession is now happily informed of Dr. Hermann Prinz's new (4th) Edition* of "Dental Materia Medica and Therapeutics," and is hereby potentially offered a new cause of congratulating itself upon the numerous enrichments presented in the new volume. While our dental literature may be apparently well supplied with text-books treating the subject either as a separate branch or in connection with dental operative procedure which might well answer the demands of the student and practitioner, yet a new volume is always welcome if it exhibits some special features or "strong points" not already elaborated in similar works. The many new and special features in Prinz's new book meet our eyes by first impression upon casually glancing through its pages, and upon closer analysis, we find the new volume is as fairly concise as it is fully comprehensive. The author's indefatigable efforts to establish dental therapeutics on modern pharmacological research within the fullest limits of present possibilities must finally win our admiration for his strong advocacy for rationalism as against empiricism. We may define materia medica and place as a synonym with it the term "pharmacology" if we hold to this distinction that the latter name, in addition, implies the *specific action* of the drugs upon the various tissues, organs, and functions of the body. In this sense, Dr. Prinz has given us more than a materia medica, he has presented us with a dental pharmacology of inestimable value.

*Dental Materia Medica and Therapeutics. By Hermann Prinz, D.D.S., A.M., M.D., Professor of Materia Medica and Therapeutics, The Thomas W. Evans Museum and Dental Institute School of Dentistry University of Pennsylvania, Philadelphia; formerly Professor of Materia Medica and Therapeutics and Director of the Research Laboratory of the Dental Department of Washington University, St. Louis. 640 pages, 146 illustrations, fourth edition. Price, $5.00. Published by The C. V. Mosby Company, St. Louis.

This pharmacology constitutes the bulk of his volume and is contained under the heading "Pharmaco-Therapeutics," a term very appropriately coined for the author's intention and accomplishment. That the author himself, lays much claim to this part of his book, appears from the prefaces of his first and subsequent editions.

Dr. Prinz's classification of drugs according to their specific action is a logical sequence of the basal consideration for which we employ drugs at all; namely, their action. For a materia medica purely, it is quite immaterial what classification is adopted, but in the pharmacologic sense, where the action of the drugs is primarily concerned, it is but natural that this action should also constitute the basis of their classification. We can scarcely conclude our remarks on this classification without commending the natural and agreeable order in which the author has arranged the various classes. For instance, the antiseptics, covering nearly one hundred pages are given first consideration because they are absolutely of prime importance to the dentist. These antiseptics are immediately followed up by the astringents and the caustics on the principle that the action of these three classes of agents is one chiefly of degree depending on the concentration. The author then introduces successively the chapters on the hemostatics, the demulcents and emollients, the irritants and counterirritants, etc.

While Prinz's "Pharmaco-Therapeutics" constitutes the essence and substance of his volume, yet, this part is not introduced until the author has acquainted us with Part I which he entitles "General Therapeutics" and in which he seizes the opportunity of laying a solid foundation for the better understanding of the succeeding subjects. This part contains the author's introduction which displays his ability as a writer and affords sufficient interest to merit its reading a number of times on account of the historical data contained in it. The chapters on the "Aims of Therapeutics," "Classification of Dental Remedy," "Methods of Administering Medicines," "Prescription Writing," etc., are well and ably written with a view of imparting thorough and reliable information.

These two parts thus briefly reviewed would constitute the subject matter of a materia medica proper, but Dr. Prinz's book being, besides, a treatise on dental therapeutics must, necessarily, also consider those remedial agents which do not participate in the characteristic of material substances. These agents are considered under the heading of "Physical-Therapeutics" which forms Part III of the volume and covers some fifty pages. The leading subjects of this part are those on "Artificial Hyperemia," "Massage," "Light Therapy," "Heat and Cold," and a few others. Those subjects are all treated in their most recent conception and acceptation. The author also introduces under this heading of Physical-Therapeutics, the new and very interesting subject on "Ionic Medication." Unfortunately, in the opinion of the reviewer, this subject should not have been included under the general heading of Physical-Therapeutics, because its treatment at this point creates the impression as though ionic medication is essentially a pharmacological one, the employment of the electric current being only a means of transporting the *material* ions into the tissues of the body. The treat-

ment of the subject, therefore, belongs rather to Pharmaco-Therapeutics than to Physical-Therapeutics.

The author has reserved for a separate part (Part IV) of his volume the very important subject of "Local Anesthesia" to which he devotes not less than seventy pages. This part is a complete and thorough exposition of every detail of local anesthesia, both in principle and in technic. Conductive anesthesia, so much talked about in recent times, is also fully considered at this point and we might add here, that this phase of anesthesia has appeared in all former editions of Prinz's, so that it is not a new subject in this book. Dr. Prinz's treatment of local anesthesia may be rightly considered as one of his strong points.

In the new edition, many of the subjects have been completely rewritten while a large number of others have received extensive alterations and additions of new matter, among which we note the following articles: "Constituents of Organic Drugs," "National Narcotic Laws," "Biologic Test for Arsenic," "Formalin Dermatitis," "Formaldehyd as a Desensitizing Agent," "Emetin in the Treatment of Pyorrhea Alveolaris," "Quinin and Urea Hydrochlorid," "Ionic Medication," and "Radio-active Substances."

We cannot conclude our review without taking due notice of the manner in which Dr. Prinz supplements his writings with fitting illustrations. The number of illustrations accompanying the text is one hundred and forty-nine. A crude figure on the black board of a triangle assists the mathematician in his intricate and extended calculations, although the dimensions of the lines are purely imaginary and do not enter into his speculations. So it is with a fitting illustration in a text; it guides the imaginative faculty which directs the mental thought. Personally the reviewer attaches great value to these illustrations, a characteristic feature of Prinz's book. The reviewer is reminded of a Dental Congress from which one seldom departs without taking with him some fresh resolutions which were engendered right in the exhibition hall. Last, and not least, we laud the publishers for the mechanical execution of the new volume which is perfect in every respect.

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